Skill Flow: A Fundamental Reconsideration of Skilled-Worker Mobility and Development

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1. April 2009

Human Development
Research Paper
2009/08

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Abstract

Large numbers of doctors, engineers, and other skilled workers from developing counties choose to move to other countries. Do their choices threaten development? The answer appears so obvious that their movement is most commonly known by the pejorative term “brain drain”. This paper reconsiders the question starting from the most mainstream, explicit definitions of “development”. Under these definitions, it is only possible to advance development by regulating skilled workers’ choices if that regulation greatly expands the substantive freedoms of others to meet their basic needs and live the lives they wish. Much existing evidence and some new evidence suggests that regulating skilled-worker mobility itself does nothing to address the underlying causes of skilled migrants’ choices, generally brings few benefits to others, and instead brings diverse unintended harm. The paper concludes with examples of effective ways that developing countries can build a skill base for development without regulating human movement. The mental shift required to take these policies seriously would be aided by dropping the sententious term “brain drain” in favor of the neutral, accurate, and concise term “skill flow”.

Keywords: skill, talent, professional, educated, graduate, degree, labor, global

 I thank Paolo Abarcar for excellent research assistance. I thank the National Statistics Office of the Philippines, the Institute of Geography and Statistics of Brazil, the National Bureau of Statistics of Kenya, and the US Bureau of the Census for making their census microdata available for public access through the Integrated Public Use Microdata Series project at the University of Minnesota.

Introduction

This paper questions, from first principles, the traditional view that reducing skilled worker emigration is a legitimate goal of development policy. It begins from the most influential mainstream definitions of "development" as an improvement in the living standards and substantive freedoms experienced by people. Properly conceived, development is almost always harmed by policies that seek to limit skilled workers' movement rather than to alter the underlying causes of skilled workers' decisions to move. Development outcomes often attributed to movement are more meaningfully attributed to the underlying forces that cause skilled workers to choose movement.

These underlying causes alone are the proper target of policy. All policy that seeks to limit migration *per se* seeks to limit choice—by definition, as migration is a choice—and constitutes coercion that does not sit well within any mainstream, thoughtful vision of development. Reduction of skilled workers' movement by itself might be justified if it had large and unambiguous benefits for others. There are nevertheless numerous theoretical and empirical reasons to doubt such benefits, and ethical problems in achieving them by limiting migration choices. This suggests that advocates of limiting and regulating skilled-worker movement subscribe to some other, usually unspecified, definition of development.

This paper summarizes recent research on the relationship between skill flow and development, with reference to an explicit definition of development. It also presents new evidence on the broad similarity of skilled workers' patterns of domestic movement and international movement, and argues that limitations of skilled workers' movement are useless or counterproductive at the international level for many of the same reasons they are rarely considered at the national level. It concludes by discussing several policy options for countries seeking establish a skill base for development that target underlying causes of movement rather than movement itself. A good first step in recognition of these complexities would be to forever drop the pejorative and inflammatory term "brain drain" in favor of a neutral, descriptive, and equally concise term such as "skill flow".

Many skilled workers leave places where they are scarce, for opportunities elsewhere

Anyone who observes the international movements of skilled workers cannot avoid being struck by two conspicuous facts.

The first fact is that great numbers of the best and brightest people from small countries and developing countries end up moving away to work in a larger, richer country. Figure 1 shows the number of skilled workers born in each country on earth who have left home to live in an OECD country. Here, a person is a "skilled worker" if he or she is age 25 years or over and is educated beyond the secondary level. The numbers are from around the year 2000.

Very large fractions of many countries' skilled workers live abroad in the OECD, as Figure 1 makes clear: For 81 countries this fraction is 15% or more, and for 34 countries it exceeds one third. Another clear pattern in the figure is that skilled workers tend to leave smaller countries at much higher rates than larger ones, and they leave lower-income countries like Ghana and Sri Lanka at much higher rates than higher-income countries like South Africa and Brazil.[1] Since the smallest, lowest-income countries tend to have the fewest skilled workers and weakest higher education systems, the overall pattern in the world is that skilled workers are departing precisely those places where they are scarcest (Docquier and Marfouk 2006). Table 1 shows that this tendency increased sharply worldwide between 1990 and 2000, particularly in Africa, the Middle East, and South Asia.

The second unmistakable fact is that skilled workers who move to work in another country can earn enormously more than those who do not. Figure 2 shows wage gaps between average high-skill professionals in selected pairs of countries. A software developer in India can roughly triple her real earnings by moving to the United States; a physician from Côte d'Ivoire can raise his

[1] Skilled workers have a greater tendency to leave smaller places apart from how poor those places are, and a greater tendency to leave poorer places apart from how small those places are. In statistical terms, an OLS multivariate regression of the skilled-worker emigration rate (in %) on both the natural logarithms of population and GDP per capita at Purchasing Power Parity in 2000, yields negative coefficients on both population (–5.99) and GDP per capita (–2.39), both of which are statistically significant at the 5% level. The regression includes the 173 countries in the Docquier and Marfouk data from Figure 1 for which all three variables are available.

real earnings by more than six times by working in France. These figures measure "real" earnings because they are adjusted for the purchasing power of a dollar in each country, and therefore roughly reflect differences in the standard of living attainable by a professional in each country. Many professionals who are willing and able to move can achieve life-changing increases in living standards.

Three waves of research on skilled labor movement

These two facts, taken together, have inspired volumes of concerned writings on skilled labor movement for the past several decades. How can countries build a base of skilled human resources if large fractions of those resources depart to serve other countries? And if the migrants' choices lead to such tremendous personal gains, how can we stop this departure without limiting migrants' choices—sacrificing the personal desires of a few migrants for the good of the many? Here is a broad-brush summary of the economic research literature's engagement with these questions.

This literature begins with a wave of theoretical treatments in the 1960s and 1970s. These papers start from the plausible assumptions that skilled workers make those around them more productive, provide important services, and are often publicly trained and paid. It follows that their removal from a country should harm economic growth and productivity, deprive stayers of services, and deplete public coffers by bidding up the wages of skilled public servants and requiring public outlays to train their replacements (Lucas 2005: 117). The question in this research is simply how large these negative effects are. Grubel and Scott (1966) argue that lost externalities are small and temporary because new skilled workers can be trained to replace the old, and that lost investment in public training is partly compensated by the fact that the origin-country sheds the burden of educating the émigrés' children. Aitken (1968) responds with theoretical reasons to believe that the lost externalities could be large: Today's loss of skilled workers' higher propensity to earn, save, and invest could have large effects down the road, and societal investments to train replacement for skilled workers who depart could have been invested in more productive uses if those workers had stayed.

Additional, influential theoretical work by Bhagwati and Hamada (1974) describes how skilled workers' departure might have all manner of negative effects even if skilled work conveys no positive externalities on others, and even if émigrés pay for their own training. Departure of the most productive and highest-earning workers lowers average income of the whole country, and forces skilled workers' wages at home so high that stayers overinvest in skill—leading to the waste of unemployed professors, engineers, and doctors. They add that skilled emigration lowers the aggregate size of the economy, which can weaken bargaining power on the international stage; "creates a sense of inadequacy" among stayers; harms national capacity to create and adopt new technologies; and skews the distribution of income.

A second wave of theoretical research, originated by Mountford (1997) and Stark et al. (1997), argues that it is precisely by causing overinvestment in human capital that skilled emigration can *foster* development of the origin country under certain conditions. They make two key assumptions that Bhagwati and Hamada do not: first, that human capital conveys a positive externality[2] on other workers, and second, that not all of those whose education investment is influenced by higher wages abroad can know for certain if they will later be able to emigrate. If many of them will not or cannot leave, the human capital they acquired nevertheless raises others' productivity at home, and this effect could in principle offset the lost productivity due to those who did leave—depending on the probability of emigration success, and on the degree to which education decisions respond to that probability. This second wave has come to be known as the "new economics of the brain drain" (Stark 2005). These models have been criticized by Schiff (2005), who points out that the increased schooling need not compensate migrant-origin countries for *natural* abilities and talents that skilled workers take with them, and that skilled emigration cannot raise domestic human capital *indefinitely* in any setting: Human capital must sooner or later reach a ceiling where further domestic increases in education are fully offset by emigration.

[2] An "externality" or spillover effect is the consequence of one party's economic activity that is experienced by unrelated parties, such as making others ill by emitting air pollution (a negative externality) or preventing others' homes from catching fire by fireproofing one's own home (a positive externality).

A third wave of research has moved beyond theory to empirics. New data from household surveys and censuses have emerged over the last five years that allow researchers to accurately measure skilled-worker movements at last, and explore how they relate to development outcomes. These efforts might be divided into two groups: those that explore correlations between skilled migration and development outcomes, and those that pursue a strategy for establishing how skilled migration *causes* development outcomes.

Empirical studies in the first group tend to find a correlation between skilled migration and adverse conditions in the country of origin. Chen and Boufford (2005) and Docquier and Marfouk (2006) point out that many countries with few skilled workers at home also have high skilled-worker emigration rates. Bhargava and Docquier (2008) find that physician emigration from sub-Saharan Africa is positively correlated with adult HIV-related deaths. Rogers (2008) finds that increases in schooling have only come with increases in economic growth in countries that exhibit low rates of skilled worker emigration. The common challenge faced by all research in this group is that correlation does not demonstrate causation. The fact that skilled professionals leave difficult places need not contain any information about whether or not their departure made those places more difficult. It is easy to imagine several country traits, both fixed and varying in time, that would tend to simultaneously produce high skilled emigration rates and various poor development outcomes like shortages of professionals, deaths, unproductive schooling, and poor growth. These underlying country traits could include the incidence and aftermath of warfare, economic uncertainty, political change, epidemics, ethnic clashes, commodity crashes, or a large number of other forces difficult to measure. No degree of correlation between skilled worker movement and poor development outcomes can therefore be interpreted as simply reflecting the *effect* of high-skill emigration.

A second group of studies in this third, empirical wave of research goes beyond correlation to adopt a strategy for measuring the true effect of migration on development outcomes such as human capital formation. They do this by seeking different forms of "natural experiments"—situations in which a naturally-varying factor changes emigration rates but does not directly change development outcomes. For example, Beine et al. (2008a) use the fact that small countries have higher emigration rates of skilled professionals than large countries. If smaller

countries do not inherently have different human capital stocks than larger countries through other channels, then any differences between human capital stocks in small and large countries must arise from the *effect* of emigration rates on human capital stocks at home. This allows them to assert that skilled worker emigration can cause net increases in home-country human capital stocks at low emigration rates. McKenzie and Rapoport (2006) explore a different type of natural experiment: Emigration patterns in today's Mexico are influenced by historical self-reinforcing emigration related to early 20th-century railroad networks, but it is not obvious that those railroads could directly affect today's schooling decisions by some other channel. This method adds credibility to their finding that higher emigration rates cause higher rates of school dropout, rather than simply being associated with dropout.

The central challenge to this latter group of empirical papers is that their claim to measure the *effect* of emigration is only as valid as the natural experiment used. If the experimental factor associated with higher migration rates does in fact cause development outcomes through some other channel than emigration, causation cannot be reliably attributed to migration. In the Beine et al. study, for example, scale economies in education systems could mean that the size of a country directly affects its education system, separately from how size affects migration. If true, this means that the relationships observed by Beine et al. may not be fully causal. Alternatively, even if the experimental factor in McKenzie and Rapoport's work causes education decisions strictly through the emigration channel, there remains the question of how much we can generalize this finding. Emigration might cause dropout when low-skill jobs are plentiful at the migration destination, as is the case for Mexico, but the reverse could be true in settings where jobs at the destination require high skill. Broadly speaking, scientific work of this kind involves a tradeoff: The more generalizable the finding, the less confidently we can attribute causation, and the more confidently we can attribute causation, the less generalizable the finding.

The standard view of skilled worker migration

Where does this research leave us? In broad strokes, the thrust of the theoretical research is that skilled worker migration can affect economic growth, service provision, and public finances in

countries of origin. The degree of this effect depends crucially on the size of externalities conveyed to others by skilled workers' human capital, the rate at which they emigrate, and how education decisions respond to opportunities abroad. The thrust of the empirical literature is that, while skilled worker emigration is typically observed in settings where many development outcomes are poor, it is difficult to make careful scientific assessments of what role—if any—skilled worker migration has in *causing* those outcomes.

This complexity has not been the hallmark of policy discussions on skilled worker migration. In 1963, British journalists coined the pejorative phrase "brain drain" to describe the emigration of British scientists from the United Kingdom, and for many this gloomy expression has come to signify all skilled worker emigration around the globe. The phrase "suffering from brain drain" occurs in over 1,200 distinct documents on the World Wide Web, suggesting unambiguous negative connotations, but "brain drain" is frequently used as a synonym for skilled worker migration, even in texts whose goal is to objectively evaluate migration's effects (e.g. Docquier and Marfouk 2006; Gibson and McKenzie 2009).

The United Nations Conference on Trade and Development warns that "the emigration of skilled workers… undermines progress in the least developed countries" (UNCTAD 2007a). This conventional wisdom is particularly solid in the health sector. Chen and Boufford (2005) call the migration of physicians from poor countries to rich countries "fatal flows", and Bach (2008: 209) asserts that the "catastrophe" of Africa's human resources for health crisis has been partly caused by emigration. The chairman of the British Medical Association has described encouraging health professional emigration from poor to rich countries as "the rape of the poorest countries."[3] Mills et al. (2008) take the extraordinary step of recommending that international recruiters of health professionals from developing countries should be tried for crimes against humanity.

In all of these and countless other public statements, the message is clear: To some degree, skilled-worker migration *causes* impoverishment, disease, and death. The free choice of skilled workers about where to live—migration itself—is held to be antithetical to development. If this

[3] Nick Triggle (2005), "Africa reels from loss of doctors", BBC News, June 27. http://news.bbc.co.uk/2/hi/health/4627709.stm

is true, then stopping skilled-worker migration per se must increase wealth, improve health, and lengthen life—for if stopping migration per se did not help solve the problem, then something else must be causing the problem.

This straightforward reasoning has led many to urge strong policy measures to limit migration by limiting or removing skilled workers' options to migrate. UNCTAD (2007b: 152) recommends that "policies in both sending and receiving countries should be targeted at reducing the flows that are shown to be most detrimental to national development." Chen and Boufford (2005) call on rich countries to avoid "raiding" poor countries to "poach" their physicians by moving toward "self-sufficiency" in doctors—that is, filling all physician jobs domestically so that none remain available to physicians from poor countries who wish to fill them. This acts to limit or remove the range of possible emigration decisions. The British National Health Service has for several years refused to directly inform health professionals from a long list of developing countries about jobs available in the United Kingdom, part of its Code of Practice for international recruitment.[4] Non-governmental organizations in the United States have called on health-sector employers who wish to engage in "ethical conduct" to likewise refuse to directly provide information to nurses in many countries about the availability of nursing jobs in the US (Academy Health 2008). By limiting flows of information about job availability, this too serves to limit or eliminate migration choices available to professionals in poor countries.

The principal opposition to such measures in research literature has not arisen from a concern that blocking movement could have unintended ethical or practical consequences, but merely that blocking movement would be insufficient to fully remedy the lack of skilled human resources in developing countries. The OECD (2007: 199) concludes that "the global health workforce crisis goes far beyond the migration issue" because "the health sector needs for human resources in developing countries … exceed the numbers of immigrant health workers in the OECD." Kinfu et al. (2009) show that in many African countries, staffing of the health system would be extremely inadequate even if outflows of health professionals were somehow reduced to zero.

[4] http://www.nhsemployers.org/primary/workforce-558.cfm

Beyond policies to limit movement, there are many policy proposals to mitigate what critics see as the adverse fiscal consequences of emigration by publicly-trained skilled workers. A committee convened by the UK House of Commons has stated that "in cases where there is clear evidence of a brain drain of scientists, researchers or health professionals from developing countries to the UK, the UK Government should institute arrangements for direct compensation for the loss of capacity in the relevant sector" (Select Committee on Science and Technology 2004: Para. 144). Bhagwati (1976) advocated an emigration tax on high-skill workers—though it is not limited to publicly-trained workers—a proposal that has evolved somewhat since (Wilson 2008). Former Irish Prime Minister Mary Robinson, among many others, has called on rich destination countries to pay for the education of health professionals who arrive there from poor countries (McColl 2008). There are many more.

Why have so many policymakers concluded that high-skill migration is detrimental to development—so detrimental that it must be regulated by coercive limits on movement, restrictions of information, and extraction of income? This view cannot arise from a careful reading of the research literature, for that literature does not conclude that skilled-worker migration generally and clearly harms development. The theoretical research finds that the degree of harm or benefit is contingent on factors that must be empirically measured, and the empirical research finds great difficulty in distinguishing between social ills that are found alongside emigration and those that are in fact caused by them.

Rather, the standard view of skilled worker migration might arise from the way many observers think about the issue—the bedrock assumptions that underlie every theoretical model, every empirical study, and every framing of policy options. It is time to revisit those core assumptions. Thinking about how we conceive of migration and development requires us first to be explicit about what we mean by 'development'.

Start from what development is: Three principles

Most writings on the relationship between migration and development rely on an implicit definition of "development". If it were explicit, that definition would resemble this: Development is an increase in the living standards in a particular place, arising from the resources assembled in that place. In this light, any decisions that disperse those crucial resources to other places must harm development. By this definition, "development" is something that either happens or does not happen in developing countries. It is meaningless to speak of it happening elsewhere.

This definition does not fit the definition of economic development reached by those who have pondered the subject profoundly. The textbooks are clear that ultimately, development is a change in the lives of people, with no strictly necessary regard for place. Ray (1998: 7) defines development as an increase in "the income, well-being, and economic capabilities of peoples". Perkins, Radelet, and Lindauer (2006: 12, 40) define it as a rise in "per capita income and product" along with "improvements in health, education, and other aspects of human welfare" affecting people's "freedom to live the lives they desire." For Todaro (2000: 16), economic development occurs when three aspects of people's lives improve: "sustenance" or basic needs of food, shelter, health, and protection; "self-esteem" or a sense of not being used by others as a tool for their own ends, stressed by Denis Goulet; and "freedom" or the ability to choose freely without constriction by material conditions or servitude, emphasized by Sir Arthur Lewis. Nothing in these definitions suggests that improvements by people in one place inherently constitute development to a greater degree than those made by people in another place.

Likewise, Nobel laureate Amartya Sen (1999: 36) has influentially argued that the "expansion of freedom" is "the primary end and the principal means" of development. This means, first, that increases in substantial freedoms are valuable to the extent that they cause generalized increases in income per capita or decreases in child mortality. But they are also, simultaneously, valuable *unconditionally* as they constitute a *form* of development. This dual nature of development implies that any policy intervention to promote development must be assessed on two separate but related criteria: 1) "whether the freedoms that people have are enhanced", which constitutes

development by itself, and also, separately, 2) whether or not "the free agency of people" achieves positive development outcomes in general, such as improved living standards, education, and health (Sen 1999: 4).

How would we evaluate the development effects of skilled-worker migration if we took these definitions seriously? Three key principles follow immediately. We can then use these principles to evaluate the development effects of skilled-worker migration. The three principles are:

1. ***People develop, not places.*** Freedom, income, health, and education are possessed by people. To say that a place is developing, by these definitions, is strictly a shorthand way of saying that these traits are improving for the people in that place. The same traits might improve to a greater degree, for the same people, in another place. This means that development does not fundamentally describe places, and that migration can be a route to development. Speaking of development for a country, village, or any other place has the perverse consequence of simply defining away the development that arises inherently from exercising the freedom to move.

2. ***The migration choice expresses freedom.*** When it is not forced, physical movement is something that people actively choose to do. The ability to make this choice is a form of freedom, of expressing free agency, of achieving the life one desires. Migration can therefore be *a form of* development, directly and immediately—unless the migration choices of some *cause* clear and substantial harm to others.

3. ***Migration choices and development outcomes have complex underlying causes.*** These definitions of development require us to think of people's choices as caused by something. They value freedom as an end, and freedom cannot have value if changed circumstances do not *cause* changed choices. We therefore miss important aspects of development when we say that migration simply *causes* some outcome. That choice has underlying causes in circumstance. The same circumstances cause development outcomes, resulting in complex and unexpected relationships between movement and development.

Taken together, these three principles suggest a clear approach to evaluating the development effects of skilled worker migration. Because only people can express freedoms, and because the choice to migrate is an expression of freedom, it tends directly to favor a country's development for its people to have the option to migrate. Anyone who seeks to favor a country's development should therefore gravely hesitate to restrict this choice. Such a restriction on the freedoms of some could only advance development by clearly causing a countervailing improvement of development outcomes that provide for the basic needs of others and expand freedoms for others. But the migration choice is caused by a range of complex underlying factors that may be affected to little or no degree solely by the removal of that choice in and of itself. And if this is true, it is not meaningful to say that the migration choice "causes" those outcomes to worsen.

The following sections explore in more detail how each of these three principles might shape how we think about the effects of high-skill migration on development. Thinking about development by the mainstream definitions above leads to profound questions about the conventional condemnation of skilled-worker migration.

First principle: People develop, not places

By the common definitions we have reviewed, development is not tied in any way to a particular place. Living standards and substantive freedoms can only expand for people; geographic spaces themselves do not have income, health, self-esteem, or freedom. Speaking of development for "Nicaragua" is meaningful, of course, as long as we keep in mind that it is only a convenient shorthand: Development for *Nicaragua* requires, and is caused only by, development for *Nicaraguans*.

Suppose a Nicaraguan engineer increases his or her substantive freedom by taking a job that pays $200 per month more than a previous job. If this occurs in Managua, many would consider this engineer's higher standard of living to represent an enhancement to "development". But if the new job is in Texas, even if it pays $2,000 per month more, many would consider it to be

irrelevant for "development"—unless the worker sends some of that money back to Nicaragua. Why? The worker, if asked, would likely feel that the higher income in Texas provides much more freedom than the higher income available in Managua (Pritchett 2006a: 87).

If we define Nicaraguan development only to occur within a certain geographic space, we arbitrarily limit "development" include to some freedoms and while ruling out others. We define freedoms acquired through movement, no matter how substantial, not to constitute development. And we do this without consulting the people who are supposed to be developing—many of whom, through their choice to move, reveal that they value this freedom. Such a view is ruled out by the definitions of development reviewed above. Grubel and Scott (1966) likewise prefer to define "country" as "an association of individuals whose collective welfare its leaders seek to maximize"—wherever they live.

But an exclusive focus on places remains very common in discussions of migration and development. To take one of myriad examples, in a recent *World Economic and Social Survey* the United Nations (2004) seeks to provide "a comprehensive review" of the issues involved in international migration, but its chapter on "economic impacts" discusses *only* the impacts on home countries and host countries. Gains to migrants are not considered part of the development discussion. The most common omnibus measure of "development" is GDP per capita—that is, per resident—which puts zero value on all gains to workers' productivity and earnings that arise from moving internationally (Clemens and Pritchett 2008).

Even worse, country-based measures of development as poverty reduction can define movement as detrimental to development by an accounting trick: Suppose a skilled Ghanaian earning US$8/day at US prices triples his real income by moving to the US and earning US$24/day. He came from far above Ghana's poverty line of roughly US$3/day, but ended up below the US poverty line.[5] The consequence of his move is that the poverty rate in *both* countries has *increased*, even though the only change in anyone's income was that one person's income tripled

[5] Ghana's "upper" poverty line is 3,708,900 cedis per adult per year, for "essential food and non-food consumption" (UNDP 2007: 193). One US dollar of purchasing power at US prices costs 3,721 cedis (ICP 2008), thus the upper poverty line at Purchasing Power Parity (US prices) is US$2.73/day. The US poverty line for a single adult is US$10,830 per year (Department of Health and Human Services 2009), thus US$29.67/day.

(Pritchett 2006b). The development discussion remains fixated on countries, but a careful definition of development leaves this fixation baseless.

A focus on individual needs and freedoms does not mean that societies are irrelevant to development. Of two people with equal incomes, one may experience less *individual* freedom simply because she lives in a society where others are richer. She may have less freedom to "appear in public without shame" than the other, for example (Sen 1999: 71). Inequality of income by itself can, then, tend directly to harm development. It is conceivable that the freedom for a few skilled workers to emigrate and greatly raise their earnings could do more harm to development than good, because a lower-skill majority cannot emigrate.

But the effect of inequality on personal freedom should not by itself make us suspect grave development consequences from high-skill migration, for at least three reasons. First, emigrants by definition do not live in the society of those who do not migrate. The direct harm to freedom that comes from proximity to others with more freedom—such as losing the freedom to walk in public without shame—does not apply to international migration. Second, for any harmful aspects of inequality that do not involve proximity, it is not clear that inequality among origin-country naturals is more harmful than broader conceptions of inequality. When a Moroccan professor from high in the income distribution moves to France and earns even more money, ending up in the middle of the French income distribution, income inequality among Moroccan naturals might increase. But income inequality among French naturals and Moroccan naturals *collectively* has *declined*. It is not obvious which of these, the increase or the decrease, weighs more heavily on human well-being and freedom.

Third, as Sen (1999: 93) cautions, "attempts to eradicate inequality can, in many circumstances, lead to loss for most—sometimes even for all." Foregoing an indivisible good solely because not everyone may have it can impoverish everyone: If there is only one motorcycle, does it enhance freedom to destroy the vehicle and force everyone to walk? Perhaps a superior alternative is to share the motorcycle (that is, foster temporary, circular migration, so that more people may spend shorter periods abroad), and help a greater number of people to finance motorcycle ownership (that is, facilitate higher education whose end goal is emigration). High-skill

migration by a greater number of people means that fewer and fewer people lack that freedom, and that each opportunity for skilled migration raises inequality among origin-country naturals to a lesser and lesser degree.

Second principle: The migration choice expresses freedom

Setting aside forced migration or human trafficking, which represent the tiny minority of movement by skilled workers, emigration from a developing country is an active choice made by a person from a developing country. The language used in discussions of "brain drain" frequently negates this simple fact by baselessly defining migration to be something that active people in destination countries "do" to passive migrants from developing countries.

This is the case when skilled workers are said to be "exported", "taken", "poached", "stolen", or "sent". These are all transitive verbs whose direct objects are passive recipients of an action taken by someone else. Few people would speak of an American nurse who chooses to work in the Philippines as having been "exported", since a person from a rich country is assumed to have agency in the migration decision—even if that person's decision was influenced by a government action such as Peace Corps sponsorship. But it is common to speak of a Filipino nurse in America as having been "exported", placing the migration decision in the hands of some unnamed other person who is not the migrant. In fact, almost all skilled migrants from developing countries choose to migrate. The fact that some governments plan for or act to influence migration does not mean that migrants are passive or that migration is not a choice. All people's choices are influenced by government action to some degree, but they make choices nonetheless.

What is expressed by skilled workers' choice to move? One way to shed light on this is to observe the relationship between home-country conditions and skilled-worker migration. Figure 3 considers African-born, tertiary-educated skilled workers living in the US in 2005-2007, and compares the years of arrival in the US of different groups of these workers. In each panel of the figure, the solid line shows the distribution of years of arrival among skilled workers from one

country, while the dotted line shows the same distribution for skilled workers from the rest of sub-Saharan Africa. In years where the solid line is higher than the dotted line, the share of that country's skilled-worker arrivals occurring in that year exceeds the share for the rest of the region. It is striking that these surges in arrivals of African skilled workers in the US often occur in association with major political and economic upheaval in the home country. The movement of skilled Africans to the US occurs in clear response to some of the 20th century's most disastrously poor governance. These patterns suggest that one thing many skilled workers express with their choice to migrate is a desire for freedom from violence, fear, political repression, uncertainty, and economic insecurity. All of these things must be forcibly accepted by skilled workers whose migration choice is limited by others.

Another way to learn more about what is expressed in the migration choice is to ask migrants, and potential migrants. Crush et al. (2005: 25) report a survey of roughly 10,000 tertiary-level students from all disciplines in six southern African countries. Over half of these students predicted that they would emigrate within five years, mostly to rich countries. They were then asked *why* they felt this way. Though income and living standards were the most common responses, almost as common were concerns about the "HIV/AIDS situation", "professional advancement", "a level of fair taxation", "personal safety", "the future of your children", and "quality upkeep of public amenities". Gibson and McKenzie (2009) track 429 top high school graduates over decades from Tonga and Papua New Guinea (PNG). 83% of top students from Tonga and 37% from Papua New Guinea had migrated abroad at one point in their lives. When asked why, answers of "health care" and "children's education" are more frequent than "salary", and answers like "safety and security" and "quality of colleagues" are almost as frequent. In short, many developing-country professionals depart to seek the same things that professionals everywhere seek.

In 2002, the World Health Organization asked similar questions of thousands of highly-trained African health workers (Awases et al. 2004: 38-43). They surveyed 2,382 nurses, doctors, pharmacists, and other health professionals in Cameroon, Ghana, Senegal, South Africa, Uganda, and Zimbabwe. Large shares of these professionals reported an intention to emigrate to a rich country, including half or more of the respondents in four of the countries. Those who said they

intended to emigrate were then asked why. Unsurprisingly, “better remuneration”, “better living conditions”, and “to save money” were very again common responses. But in many countries a more common answer was “to gain experience” or “upgrade qualifications”. Roughly as common were the responses “lack of facilities”, “poor management”, “safer environment”, and “violence and crime”.

These answers are familiar to observers of educated people in every country on earth: They are the same reasons that large numbers of skilled workers within countries depart rural areas, small provinces, and impoverished ghettos in favor of other places. Skilled workers typically congregate in richer urban areas to seek better earnings and reap the returns from their long investments in training, to be sure, but they also wish to maintain and upgrade their professional knowledge, work with others who are skilled and talented, and seek security and health for themselves and their families. This suggests that we might expect to find the broad patterns of skilled workers’ international movement to be analogous to their patterns of domestic movement.

Figure 4 repeats the same analysis in Figure 1 at the domestic level, for four very different countries. In the upper left of the figure, data from the 2000 census of Brazil are used to plot each state of Brazil. The vertical axis considers workers 25 and over who have attained tertiary education, and shows the number who were born in each state but live outside of that state, as a percentage of all born in that state. The horizontal axis shows the population of each state. There is a clear tendency for skilled workers to depart states that are small and/or poor, such as Acre and Piauí. The rest of the figure reveals these same overall trends in states of the United States in 2000, provinces of the Philippines in 1990, and districts of Kenya in 1999.[6]

Do these domestic movements of skilled workers look much different from international movements of skilled workers? Figure 5 overlays the patterns of international movement in Figure 1 with patterns of domestic movement in Figure 4, so that they can be directly compared. It is immediately clear that small, relatively low-income countries do not experience greater departure rates of skilled workers than small, relatively low-income areas within countries. Cape

[6] In each case the most recently publicly-available census microdata including place of birth are used; the Philippines census data from 2000 do not include detailed place of birth for each individual.

Verde, Fiji, Mauritius, and Liberia, all of which are frequently seen as having problems *caused* by skilled worker emigration, have similar rates of departure to comparably sized districts of Kenya. New Zealand, Comoros, Iceland, and Equatorial Guinea have similar departure rates to comparably-sized island provinces of the Philippines. Ghana, Vietnam, and Angola have similar departure rates to comparably-sized US states. The Dominican Republic, Portugal, and South Africa have similar departure rates to comparably-sized states of Brazil.

This striking comparison suggests a revealing thought exercise. When countries wish to keep skilled workers in small, rural, or impoverished areas, they rarely or never consider the migration choice *itself* to cause underdevelopment. They therefore do not consider eliminating the choice *itself*—that is, measures to coerce migrants' decisions without consulting them—to enhance development in those areas. Few in Brazil would consider "codes of conduct" preventing employers from advertising jobs in São Paulo to workers from the impoverished Northeast. Few in the United States would discuss "developing" impoverished ghettos or Native American reservations by preventing employers from recruiting there, no matter how scarce skilled professionals are in those places. Few in the Philippines would consider enhancing development in Mindanao by making Manila "self-sufficient" in professionals, thereby closing professional life in Manila to people from the south. And few in Kenya would entertain stopping the departure of educated, intelligent people from the Busia *per se* as effective development policy.

Beine et al. (2008b) report that "small states are the main losers from the brain drain" and lament the fact that "there seem to be few policy options available that can help seriously dampen the extent of the brain drain." That is, when skilled workers depart a country of 300,000 people, researchers lament that nothing can be done to stop it, assuming implicitly that reducing such movement is desirable. But when skilled workers exhibit precisely the same tendency to depart a remote Kenyan district of 300,000 people, as we see in Figure 5, we lose confidence that stopping this movement is obviously desirable. We understand that Kenyans' most basic freedoms are at stake, that development depends heavily on all manner of complex agglomeration economies, and that little development in remote districts might arise from "dampening" movement in and of itself—that is, from limiting people's ability to choose which district they live in. (If limiting choice were not the objective, then the target of policy would be

the forces causing the migration choice, rather than migration itself, which is merely a choice.) Some countries do require certain highly educated graduates to spend time in rural areas—Colombia requires a "rural year" of its medical graduates—but this is universally limited in scope and duration.

Why is the conventional wisdom about small countries so different from our instinct about small parts of countries? One reason the two settings might reasonably differ would be if we could expect a country's central government to redistribute the benefits of national agglomeration economies to its own regions, but not to other countries. In fact, small countries receive proportionately more in international redistribution than many countries' regions receive in national redistribution. No US state, for example, receives more than 14% of its economic product in total transfers from the US federal government, and 45 of the 50 US states receive less than 10% of their product in transfers.[7] Almost all small developing countries receive aid from rich migrant-destination countries, aid that amounts to much more than 10% of GDP in Kiribati, Tonga, Micronesia, Samoa, Vanuatu, Solomon Islands, Cape Verde, Bhutan, Djibouti, Guyana, Guinea-Bissau, The Gambia, Mongolia, Mauritania, Liberia, and many other small states.[8] So a lack of international fiscal flows against the migration current cannot be a reason to view skilled worker migration from small countries systematically differently than that from small regions.

Perhaps the difference in how these movement choices are viewed lies more in a simple assumption that 'development' is something that should or must happen in a particular place, unrelated to the inherent value of skilled workers' free choices that many people recognize intuitively at the national level. Such an assumption is at odds with the definitions of development above, so advocates of that view should be asked to articulate a superior definition of development. Such a definition is absent from most discussion of skill flow.

[7] Leonard and Walder (2000) calculate total federal transfers to each US state, and BEA (2004) provides the Gross State Product of each US state in 2000. The highest ratio of net transfers to Gross State Product occurs in New Mexico, which received US$6.5 billion in net transfers, amounting to 13.6% of its Gross State Product of US$50.5 billion. Mississippi, West Virginia, Montana, and North Dakota are the other states receiving over 10% in transfers.
[8] Aid/GDP figures from the World Bank (2008), for the year 2000 (the same year as the US state figures).

Third principle: Migration choices and development outcomes have complex underlying causes

Beyond valuing freedom directly, the above definitions of development require that freedom be a means of development, that it *cause* desirable outcomes for other people, such as increased incomes and better health. Several observers mentioned above have concluded instead that the migration choice of physicians *causes* Africans to die, that the migration choice of engineers *causes* fiscal losses in India, and so on. If this is true, then the net development effect of skill flow involves a tradeoff between the positive, direct effects on freedom, and the negative effects of some people's freedom on others. Because the former positive effect is unambiguous, the net effect depends crucial on how much skilled workers' freedom causes harm to others. It is certainly conceivable that the harm caused to others by a given skilled worker's emigration is so large as to justify societal coercion of that worker's decisions.

The migration decision is the proximate cause of a skilled person's departure, but this choice is in turn caused by a complex web of underlying forces. These other, deeper necessary conditions for the departure and its consequences might include armed conflict, institutional failure, corruption, abysmal working conditions, poor training opportunities, political repression, a mismatch between national higher education curricula and local needs, institutional impediments to self-financing education, and others. If the migration choice is seen as the cause of a skilled person's absence or a fiscal loss, then removing the choice is the solution. But removing choice not only runs counter to development per se by restricting freedoms; it also does nothing to address the underlying causes, and therefore is unlikely to pass the test of *causing* development.

Here we consider a range of development outcomes, some undesirable and some desirable, and examine theory and evidence on the degree to which migration choices by skilled workers cause these outcomes. If skill flow itself is a substantial cause of poor development outcomes, reducing skill flow itself must be a substantial cause of improved development outcomes.

Does reducing skill flow improve public services?

There is evidence that skilled workers in developing countries convey important positive externalities on the people around them, in part by providing crucial health and education services. It is difficult to believe that a Ugandan doctor earning US$67 per month is earning the full value of her social product (Vujicic et al. 2004). There is some sense, then, in which the emigration of a skilled worker from a developing country can substantially reduce the positive externality experienced by other people there. It is common to proceed directly from this fact to the idea that reducing emigration is a proper way to substantially raise the positive externality experienced by people in developing countries. But this does not follow, for four reasons.

First, the positive externalities skilled workers can exert on those around them are often severely limited by large underlying forces, many of which also motivate the emigration choice. A Mozambican physician's positive externality, for example, might be shaped by low wages in Mozambique's public health service, few rural service incentives, few performance incentives of any kind, a lack of adequate medical supplies and pharmaceuticals, a mismatch between her medical training and the health problems of the poorest, the absence of good schools for her children in rural areas, poor transportation infrastructure to reach patients most in need, or an abysmal sanitation system that makes attempts at primary care ineffective, among other forces (Filmer et al. 2000). To illustrate just one of these—the lack of rural service incentives—policies that limit international movement choices per se do not change the strong incentive for African physicians to concentrate in urban areas far from the least-served populations. In Kenya, the capital Nairobi is home to just 8.3% of the population, but 65.8% of the physicians (Kenya Ministry of Health 2007: 3, 20). More Mozambican physicians live in the capital Maputo (51%) than in the entire rest of Mozambique, though Maputo comprises just 8% of the national population (Ministério da Saúde 2004: 67). Roughly half of Ethiopian physicians work in the capital Addis Ababa, where only one in twenty Ethiopians live (de Laat and Jack 2008).

No evidence suggests that a physician obliged to remain in any of these countries by a limitation on her migration choices *per se* would face any additional incentive to serve the least-served populations. This and many other reasons may be why the numbers of doctors and nurses born in

each African country who live abroad are not correlated with lower health worker densities, less general availability of health care, or worse generalized public health outcomes at home such as child mortality (Clemens 2007). While there is evidence of a correlation between physician emigration from sub-Saharan Africa and adult HIV-related deaths (Bhargava and Docquier 2008), there are many factors that could produce this correlation because true causation of death by emigration, and the same research paradoxically finds no correlation between physician emigration and life expectancy. The connection between skilled-worker movements per se and social outcomes is highly complex and dependent on context (Lucas 2005: 120).

Second, no matter how large the positive externality of any service provision, migration choices by skilled workers do not "cause" their loss in a meaningful sense. This point might be best made by a development analogy from outside the migration field, since there is such universal acceptance of statements resembling, "Migration causes the loss of crucial service providers." What, for example, is the cause of hyperinflation? It would be strictly correct to say that hyperinflation is *caused* by merchants' choice to raise prices rapidly. Certainly poor people could purchase more food if merchants did not make that choice, so there is some logical sense in which merchants' choices could *cause* people to starve. But while this is strictly correct, merchants' choices are merely the proximate cause of hyperinflation. The underlying cause of hyperinflation is the government's choice to undermine paper currency by printing mountains of it. This circumstance causes merchants' choice to mark up prices, which then "causes" inflation only vacuously—pricing choices cause inflation by definition. Many governments have nevertheless decided that merchants' choices are the meaningful *cause* of hyperinflation, and have sought to solve the problem by coercing merchants' choices with price freezes. Policies of this kind have failed utterly to halt hyperinflation in Brazil, Zimbabwe, and elsewhere. They have failed because they addressed the proximate cause—if choices are the cause, coercion is the solution—rather than addressing the underlying cause.

The following sentence is strictly true but contains no information: "Merchants' prices are rising because merchants are choosing to raise prices". For the same reason the following sentence is true but says nothing: "Pharmacists are not in Ethiopia because they are choosing to leave Ethiopia". If we stop at this empty tautology, and jump immediately to find ways of limiting

choice, we have learned nothing about the causes of the choice and our efforts are doomed. We do the same when we recite the information-free tautology that "migration causes the loss of service providers" (i.e. skilled workers are not providing services in one place "because" they are providing services in another place—which is true by definition), and seek ways to stop migration. If we agree with Sen and others that freedom lies at the heart of a meaningful definition of development, we must look instead to the causes of free individuals' choices to understand the causes of development outcomes.

Third, *even if* skilled workers' positive externalities were large, and *even if* migration were the fundamental cause of their loss, strengthening service provision by stopping migration per se is highly problematic. A large literature has shown, for example, that the skills and qualifications of schoolteachers in the US have declined sharply over the last half century because skilled women now have a much broader range of career choices available to them (Stoddard 2003, Corcoran et al. 2004, Bacolod 2007). The exodus of skilled women from the classroom might plausibly be the cause, in some sense, of a loss of positive externalities to schoolchildren. An observer with no regard for women's ambitions and fundamental rights might define this exodus pejoratively as "classroom drain". But few would dream of asking management consulting firms not to recruit women in order to limit skilled women's choices. Why? Because women's freedom to choose career mobility has inherent value, and because we understand immediately that women's choices to leave the classroom are caused by underlying forces that trapping them in classrooms would do little to change. These same intuitions drop away in many discussions of limiting the international recruitment of skilled workers—many of whom, whether born as women or not, happened to be born in developing countries.

Finally, even if reducing migration per se were both effective and ethical, there is an enormous informational barrier to the targeted application of limiting human movement. Recruitment bans targeted at countries where professionals are in "shortage" (e.g. Alinsao et al. 2008) face important practical barriers in determining which countries face objective "shortages". It would be extremely difficult, for example, for any agency to regulate international engineer recruiting by monthly surveys of which countries have acute shortages of skilled engineers and which do not. Most developing countries claim shortages of most types of skilled professionals, so such an

agency would either recommend stopping all movement universally or would need to run detailed, high-frequency studies of labor supply and demand in hundreds of sectors each in scores of countries. Most countries have sufficient difficulty predicting and planning supply and demand in their own workforces; no plausible agency could do so for the entire world in real time. Supporters of movement restrictions would therefore need to feel comfortable with limiting others' freedoms in the name of unknowable benefits.

Does reducing skill flow raise economic growth?

Skilled workers in poor countries generally earn more, save more, invest more, and innovate more than other workers. There is a sense, then, in which the departure of a skilled worker is the proximate cause of a reduction in factors that plausibly influence the overall growth of the economy. There is also substantial though inconclusive evidence that population health per se raises economic growth (Bloom and Canning 2008), and if emigration caused a deterioration in health service provision, it is possible that emigration could end up reducing economic growth. Again, many observers take these facts as evidence that reducing skilled worker emigration is a legitimate tool to raise economic growth. This step also does not follow, for four reasons.

First, the mechanical reduction in GDP when a skilled worker departs does not by itself reduce the welfare of those who do not leave. The effect on stayers depends crucially on the externality skilled workers exert on the productivity of others nearby. While this externality seems intuitively obvious, it is typically so small that it has been difficult to detect in real developing countries. One way to test for these productivity externalities is to observe developing countries where workers' average education increased, and test whether overall output per worker went up by more than the private wage gains captured by those who got educated. Pritchett (2006c: 683) reviews a large body of evidence on this subject and concludes that the overall output gain is not systematically higher than the private gains from education; that is, "there is no particular evidence for an output externality of substantial magnitude". An important reason for this may be that poor institutions and policies in many developing countries constrain the productivity of human capital, and these institutions and policies unfortunately have not been greatly improved

even by large increases in the stock of educated people per se (Rogers 2008, Hanushek and Woessman 2008).

Second, even if limits to skilled worker migration per se improved health outcomes—and above there are many reasons to doubt this—the macroeconomic evidence that health improvements cause economic growth is inconclusive and controversial. Researchers have found it difficult to disentangle the causal relationship between health and growth, a large portion of which could indicate that growth causes improvements in health (Jack and Lewis 2009). A further portion of this relationship is likely to be accounted for by simultaneous causation of improved productivity and better health by third factors, such as early childhood nutrition, as new long-term longitudinal evidence suggests (Behrman 2008).

Third, again we face the issue that even if growth externalities from skilled workers were large, the departure of those workers could not meaningfully be described as the "cause" of the loss of those externalities. In a famine, if there is only enough food for one of two people, it is strictly true that the person who chooses to take the food is the proximate cause of the other's starvation. But the choice to take this food is not a meaningful "cause" of starvation, because constraining this choice would not reduce the amount of starvation. Rather, only the underlying causes of the famine hold the meaningful cause of the starvation in question, and only changing those underlying causes can reduce the amount of starvation. Likewise, to say that an inventor is not innovating in Laos "because" she is innovating in Australia contains no information about *why* there is little economic innovation in Laos. For this we must look beyond the migration choice to the underlying causes of the migration choice.

Fourth, even if positive economic externalities were large and skilled worker emigration *caused* them to be lost, it is not clear that skilled workers thereby lose the right to take away those positive externalities at will. That is, it is not obvious that skilled workers' positive externalities are owned by the people who were born near to those skilled workers. Bhagwati and Dellalfar (1973) argue that the loss of positive productivity externalities to skilled migrants' countries of origin justifies a tax on skilled émigré citizens of developing countries, to be collected under UN

auspices in rich destination countries and sent back to the countries of origin, no matter who paid for those émigrés' education. But such a policy leaves many things unexplained.

The argument for an emigration tax does not explain why taking away a positive externality is equivalent to actually causing harm to others, as Bhagwati and Dellafar assert. On the contrary, many ethicists find that ethical restrictions on "harming" are much stronger than restrictions on "not aiding" (e.g. Steinbock and Norcross 1994, Kamm 2007). Few would consider it proper to prosecute for murder a doctor who chose not to work in a slum, even if there were more deaths in the world due to that choice. Beyond this, it does not explain why the *positive* externalities of an Indian engineer are considered the property of the Indian nation as a whole, while any *negative* externalities that person exerts are not national property but exclusively individual property: Few Indians would accept to be punished for murders committed by other Indians. Finally, it leaves unexplained why an Indian doctor's decision not to care for Indians amounts to a confiscation, whereas the decision of an American doctor not to care for Indians does not. Coercing French nurses to go to Africa is considered immoral even if that coercion might cause deaths to be avoided, but coercing African physicians to be in Africa is considered moral. The basis for this is unclear.

In short, the emigration tax is justified by a series of unexamined assumptions about property rights: that individuals own their negative externalities but not their positive externalities; that groups of people own individuals' positive externalities; and that only groups of people born near skilled workers' birthplace own their positive externalities, while groups born far away do not. Not one of these is obvious, and if any one of them is false, the justification for coercing or taxing skill flow falls into doubt.

One reason that a skilled emigrants' positive externalities might be considered national property is that skilled citizens abroad choose to "retain their national status and associated rights, including the right to vote, but carry no corresponding tax obligation" (Bhagwati 1979). But this makes no provision for the fact that large numbers of skilled workers abroad who would prefer to change their citizenship are forcibly prevented from doing so. In 2008, the waiting list for naturalization applications to the United States stood at over 2.5 million people (Meissner and

Kerwin 2009: 62). It is likely that hundreds of thousands of these people are skilled workers who would like to become US citizens but cannot.

Another reason that skilled emigrants' positive externalities might be considered public property of the country of origin might be if their training was publicly financed, though the Bhagwati proposal is not limited to publicly trained workers. This, too, ignores the reality that in many poor countries no high quality privately-funded higher education is available, and even where it is available, those who cannot afford to pay for it up front lack functioning credit markets with which to pay for their training via later gains to migration. Many skilled workers had no other way to become skilled other than to accept public training. In both cases the emigration tax falls upon actions that are coerced. Taxing actions to which there is no reasonable alternative is the best policy if the only goal is to maximize state revenue, but exacting retribution for actions that were coerced is ethically difficult.

Does reducing skill flow improve public finances?

Another common assertion is that the emigration of publicly-trained skilled workers directly and necessarily causes the state's financial investment in those people to become ineffective at promoting valuable social outcomes. Kirigia et al. (2006), for example, show that the Kenyan public invests US$43,180 in the education (since birth) of a Registered Nurse, and US$65,997 in the education (since birth) of each physician—astronomical sums in a country where the average person earns about US$1.30 per day.[9] Clearly, the departure of a skilled worker is the proximate cause of a change in the amount and distribution of the returns to that investment. It is also the proximate cause of a reduction in revenues from taxes that person would have paid at home.

Thus many observers have concluded that the departure of a skilled person constitutes a massive loss of public finance to the country of origin. Desai et al. (2009) claim that the emigration of skilled Indians causes India to lose 2.5% of fiscal revenue. Some have gone further, to suggest

[9] This is measured at exchange rates, not purchasing power parity, for comparability with the Kirigia et al. numbers. According to the World Bank (2008), GDP per capita in Kenya in 2006 was KSh 34,052, and on average in 2006 one US dollar was worth KSh 72.

that the value of the loss should be set far above any direct cost of public training—such as the value of what that training cost would have earned if invested in a bank account instead (e.g. Kirigia et al. 2006), or what the cost of training that person in the destination country would have been (Bhargava 2005).

A common reading of these arguments is that limiting or taxing skilled migration is a legitimate policy to improve public finance in developing countries. This does not follow, for at least four reasons.

First, the degree to which emigration is even a proximate cause of lost training investments depends not on the cost of training, but on the social return to this investment. The public loss from the emigration of publicly-trained astrologers, for example, would be zero regardless of their training cost, because the social return on that training investment is low no matter how large it is. That is an extreme example to make a point, but several factors discussed above can limit the social return of large investments in skilled-worker training in many settings, even when workers do not emigrate: The most highly skilled tend to work in urban areas, tend to work with each other rather than fanning out to improve poorly run organizations, tend to require services and materials for the proper exercise of their professions that can be low-quality or absent, tend to seek safe havens for their investments abroad, and tend to sell their services in the private sector wherever possible (such as the majority of publicly-trained physicians in South Africa).

Second, not just the size of the social return matters, but the size of the social return to training highly skilled professionals *relative to* the size of the social return that would be reaped from alternative uses of the same money. What, for example, is the social loss proximately caused by the departure of a highly skilled Registered Nurse with 16 years of publicly-financed education? The government, in paying for his training in primary health care, chose not to spend the same money on preventive public health measures—such as improved sanitation, basic hygiene education, and HIV education. Not only might such investments be greatly more effective in some settings, but they are also immobile. The government also chose to subsidize the training of a very highly educated health professional, when several mid-level health workers might have

been trained at the same expense, with much greater impact. Some communities with basic needs might have been better served by a very different subsidy policy. This underlines that once again, the departure of the nurse is exclusively the proximate cause of the lost subsidy, not the underlying cause. The underlying causes include a series of policy decisions by the government, as well as the range of factors that caused the migration choice. The great majority of Registered Nurses who depart the Philippines, for example, paid for their own education, while a much larger fraction of South African emigrant nurses were publicly trained. This is related to government policy decisions, such as government obstacles to the accreditation of private Registered Nurse training programs in South Africa. Those policies are an underlying cause of fiscal losses; migration is solely a proximate cause.

Third, defining skilled worker movement as a public loss in the full amount of their training is equivalent to defining the movement of an educated person as the confiscation of public property. That is, it asserts an unlimited public property right in the person that public training helped that worker become. In most countries, neither individuals nor states may acquire unlimited property rights in people, even if a worker voluntarily agrees to sell an unlimited property right in him or herself. The fact that voluntary agreement is insufficient to justify recognition of unlimited property rights in people shows recognition that even an apparently voluntary agreement may be coerced by factors beyond the worker's control. Workers who wish to acquire skill often have no access to privately-financed higher education, either because quality private institutions are either banned or simply do not exist where they were born, or because absent credit markets prevent them from paying for a private education.

Most states do permit *limited* contractual relationships that limit movement in exchange for public funding of higher education: Brazil's National Council for Scientific and Technological Development, for example, awards scholarships for a few years of postgraduate study abroad that require the same number of years of residence in Brazil thereafter. The Turkish government's Scientific and Technological Research Council also publicly sponsors doctoral research abroad in exchange for an obligation to live thereafter in Turkey, usually for no more than two years. The United States government will pay for much of the training cost of physicians who agree to two years of work in certain facilities on Native American reservations.

In all of these cases and many others, skilled workers voluntarily allow *limited* restrictions on their movement in exchange for public funds. But few modern societies would consider it acceptable to require a lifetime of work in poor conditions in exchange for a government scholarship, for this would constitute the unlimited ownership of a person by the state. Equating a person's emigration, at any point in their lives, to the "loss" of the full cost of his or her training, or the "loss" of the person's lifetime earnings, asserts an *unlimited* statist property right in human beings that no modern state should consider. In fact, many skilled emigrants have already served their countries for long periods before emigrating. The average African-trained physician in the US and Canada, for example, arrived in North America more than seven years after receiving their medical degree (Clemens 2009).

Fourth, the creation of publicly-useful human capital is not the sole and exclusive objective of education. Some nonzero portion of the value of educating an individual lies in creating conditions for individuals with natural talents to realize their ambitions via higher education, regardless of where those ambitions take them. There is value in the creation of societies where individuals have the possibility to attain those personal goals. Suggesting that the departure of a skilled worker renders an education subsidy 100% "lost" and ineffective at achieving valuable social outcomes negates the value of the direct role of higher education in expanding the freedom of the people who receive it. No reasonable definition of development allows such an unqualified negation, but this complete negation is an inescapable consequence of claiming that education expenditures are "lost" if the educated person moves away. The constitutions of many developing countries, including South Africa and Nigeria, specify that any person qualified to receive higher education has a *right* to it. Such a statement is nonsensical if the exclusive social value of education expenditures arises from their external effects on others. This certainly does not mean, as discussed above, that public training of highly skilled future emigrants is the optimal use of scarce public resources; in many cases it is not. But it does mean that an exclusively statist definition of public schooling investments as valueless if the schooled person leaves the state is dehumanizing. Part of the value of education is retained as long as the educated person is alive, no matter where he or she lives. This means that the "loss" associated with an educated person's movement cannot amount to the full value of training cost.

Does reducing skill flow lower the demand for education?

Thus far the discussion has urged consideration of the underlying causes of development outcomes rather than focusing on migration as their proximate cause. But even the proximate effects of migration can be complex and difficult to predict. The prospect of migration, for example, can change the decisions of people who do not migrate. Just as the education decisions of bright students in rural areas are shaped by faraway urban centers—whether or not those students move to a city—so the education decisions of bright students in developing countries can be shaped by the option to emigrate even if they do not. A limitation or elimination of the migration choice might, then, be a proximate cause of reduced investment in education. Even in an accounting of migration's proximate effects on human capital, effects of this kind must be accounted for.

The Philippines, for example, is a developing country from which more nurses depart to work in a rich country than from any other country in the world. But there are about six times as many nurses per capita *in* the Philippines than there are in countries at a similar level of income—much more than in (richer) Thailand and Malaysia, from which far fewer nurses depart, and more even than in the United Kingdom or Austria (WHO 2005: 50-52). It is difficult to find another explanation for this extraordinary anomaly other than the fact that large numbers of people whose education decisions were shaped by the migration opportunity did not leave the Philippines—even if larger numbers *did* leave.

Across all disciplines, in fact, the Philippines has one of the world's highest tertiary enrollment rates while maintaining one of the world's lowest rates of public expenditure on tertiary training per student (Lucas 2005: 128). This state of affairs is doubtlessly influenced by the fact that close to half of workers leaving the Philippines have tertiary education. Some of the shift towards private education may result from underfunding of public institutions, and a concomitant decrease in the quality of public education. But a decrease in the supply of public tertiary education cannot explain the enormous demand for private tertiary education in the Philippines, where overall tertiary enrollment exceeds that of much richer countries like Tunisia, Brazil, Iran,

and Botswana, and roughly equals that of Hong Kong (World Bank 2008). More generally, there is broad evidence across countries that unless outflows of skilled workers are extremely high, countries with larger flows of skilled workers abroad tend to have more skilled workers at home than those with less migration of skilled workers (Beine et al. 2008a).

This need not apply in all settings. The emigration prospect is certainly just one of several necessary conditions for the domestic accumulation of human capital. McKenzie and Rapoport (2006) show for example, that the prospect of emigrating from Mexico for low-skill but high-paying jobs in the United States might tend to *diminish* investment in education in Mexico. They find that just living in a household with international migrant members causes boys to be 22 percent less likely to complete junior high school, and causes boys and girls to be 13-15% less likely to complete high school. This makes sense in a context where households' principal choice is between investing in schooling at home and investing in migration for *unskilled* work abroad. In a very different setting, Chand and Clemens (2008) show that emigration of workers from Fiji to high-skill jobs in Australia caused increased investment in higher education in Fiji. This effect is so large that, though roughly one third of the Indo-Fijian population has emigrated in the last three decades and skilled workers are overrepresented among émigrés, the absolute number of skilled Indo-Fijian workers inside Fiji has greatly increased. This too makes sense in a setting where, due to skill-selective immigration policies in the destination countries, Fiji Islander households' principal choice is between investing in schooling at home and investing in schooling plus possible subsequent migration for *skilled* work abroad.

Further evidence from domestic labor mobility suggests that the achievement of success by educated workers from low-income communities can change schooling decisions of those of those who may or may not follow in their footsteps. Jensen (2008) uses a randomized controlled trial to show that providing information about the earnings gains associated with education to children in the Dominican Republic reduces school dropout. Nguyen (2008) uses a related experiment in Madagascar to show that provision of such information raises test scores and attendance, especially if the information is presented by someone from a poor background. There is little reason to believe that similar forces do not operate when skilled workers achieve success in other countries, and there is reason to be suspicious of Bhagwati and Hamada's (1974)

assertion that the success of skilled emigrants inspires little besides "a sense of inadequacy" among those who do not emigrate. When the highly educated son of a Kenyan achieves political success in the United States, how does this affect how Kenyan children see themselves and their own potential for achievement?

Beyond these works, little research plausibly estimates the *causal* relationship between migration and human capital stocks. But by themselves they reveal that the proximate effects of limiting the migration choice *per se* on domestic human capital stocks can depend heavily on context. What is clear is that there are reasons to doubt that skilled migration can be unconditionally considered even a proximate cause of skill depletion.

Does reducing skill flow reduce international trade and capital flows?

Many people who live and work abroad interact extensively with their countries of origin. The best-known example of this phenomenon is workers' remittances: Foreign workers in the United States sent more money to their home countries in 2006 than the US government sent in foreign aid to the entire world (IADB 2007). Remittances are roughly one-fifth the size of gross domestic product in Albania, El Salvador, and Haiti.

Data on skilled workers' remittances in particular are limited, and researchers debate whether or not skilled migrants tend to send less money than unskilled ones. Skilled migrants from many countries nevertheless send large sums home. Osili (2007) studies a sample of Nigerian households in the US, whose heads on average have education beyond the university level and have been out of Nigeria for 14 years. Despite this the average household sends about $6,000 per year to Nigeria (including households that send none). The migration choice is certainly a proximate cause of these substantial resource flows.

But cash gifts are just the beginning of the story. Other, perhaps far more important, interactions occur between skilled workers abroad and their home countries. Indian, Chinese, and Israeli immigrants to the United States, for example, have been crucial to the formation of

manufacturing and information technology hubs in those countries. Skilled workers abroad serve as intermediaries, commercial ambassadors, role models, mentors, partners, and investors for ventures back home (Saxenian 2006, Devane 2006). None of this accords with a model of the world in which growth and innovation are a simple function of the concentration of skilled individuals in one place. Saxenian (2006) shows that the spread of new industries via international networks of skilled professionals can be rapid and highly unpredictable, can find niches even amidst otherwise low levels of overall development, and depends crucially on the openness of the business and political environment at home: Countries like Iran, Vietnam, and Russia have benefitted less in high-tech business formation via their skilled workers abroad than India, Taiwan, Mainland China, and Israel have.

In general, it is well documented that the share of foreign direct investment that countries receive from the United States is positively correlated with the number of college graduates from that country present in the United States (Javorcik et al. 2006, Kugler and Rapoport 2007, Docquier and Lodigiani 2009). Beyond this, the more highly skilled emigrants from one country live in another, the more trade occurs between those countries (Rauch 1999; Felbermayr and Toubal 2008). Skilled emigrants can also facilitate skilled emigration from the same country, so that all of these phenomena are enhanced and reinforced over time.

Does reducing skill flow limit the international diffusion of ideas and norms?

Many skilled migrants from poor countries return home bringing with them savings, skills, raised expectations, and familiarity with well-functioning political, social and market institutions. To take one of many possible examples: Of the foreign students that received a U.S. doctorate in 1991, 42 percent had left the country by 2001, most acquiring substantial work experience before departure (Finn 2003). Although this departure rate was only 14 percent for Indian students, it

was 50 percent for Turks, 53 percent for Africans (outside South Africa), and 59 percent for Peruvians. The large majority of these departures represent returns to the country of origin.[10]

These people can help bring knowledge and norms to their home countries—including technical skills, firsthand experience of high-quality institutions, and raised expectations for their colleagues and institutions at home—whether they return home or simply communicate with others back home. Kerr (2008) gives evidence that high-skill immigration to the United States causes international diffusion of scientific and technical knowledge as measured by patent citations. Beine et al. (2008c) find a relationship between migrant destination-country fertility rates and fertility rates in countries of migrant origin, which could suggest a direct transfer of norms from migrants, though other forces could be at work (such as the relationship between migration and the returns to women's education).

There is also increasing evidence that emigrants have spurred the improvement of political institutions in their home countries. Spilimbergo (2009) finds that democratic reform has progressed substantially more in developing countries that have sent more students to universities in democratic countries. Saxenian (2006) documents cases in which skilled emigrants "engage policymakers on policies to improve the local environment for entrepreneurship; they emphatically reject the familial, opaque, and frequently corrupt business practices that dominate in many developing economies." Iskander (2009) gives a detailed account of how knowledge and norms brought home by a group of Moroccans returning from France shaped basic infrastructure investments by the Moroccan government in their home region.

In many cases, migrants can effect such positive change in governance institutions personally, at the very top. Numerous leaders broadly believed to have fostered development in their countries of origin were return migrants following a long period of work and study in a rich country. These include Deng Xiaoping of China, Mohandas K. Gandhi of India, Lee Kwan-Yew of Singapore, Ellen Johnson-Sirleaf of Liberia, Nobel laureate José Ramos Horta of East Timor, and Joaquim

[10] NSB (2003) (Table 2-12, pages 2-36) shows that 41 percent of Turkish science and engineering doctoral recipients return home (thus about four-fifths of the 50 percent who depart for any other country), and 10 percent of Indian recipients (thus over two-thirds of the 14 percent who depart).

Chissano of Mozambique, winner of the Mo Ibrahim Foundation's Prize for Achievement in African Leadership. Many leaders' return-migrant technical advisors have also helped foster conditions for expanded economic opportunities. These include Widjojo Nitisastro, Ali Wardhana, and others popularly known as the "Berkeley Mafia" in Indonesia, widely credited with sustaining decades of growth and poverty reduction (Thee 2003), and Sergio de Castro, Pablo Baraona, other colleagues known as the "Chicago Boys" in Chile, who helped Chile become one of the fastest-growing Latin American economies for thirty years (Valdés 1995).

Of course there is nothing magical or automatically "good" about return migrants; Khalid Sheikh Mohammed, who orchestrated several major terrorist attacks including the destruction of the World Trade Center while based in South Asia, lived and studied in North Carolina. Nevertheless, a close look at nearly all developing countries where sustained economic growth has occurred since World War II reveals important movements of people in key public and private sector positions to and from rich countries.

Ways to deploy skills for development

The development effects of movement itself, then, are highly complex and unpredictable. Policymakers who try to promote development by limiting skilled-worker movement itself assert an understanding of these complex systems that we simply do not have. The underlying causes of movement are a far better target for policy, not only because this is more effective, but because such an approach shows a hesitancy to coerce choice that is demanded by a definition of development reflecting the inherent value of freedom.

Worst practice: Coercive policies that treat movement itself as the problem

Many proposed and tried policy interventions are built around altering skill flow itself, via coercion, punishment, or confiscation, without addressing the underlying causes of migration choices. These include:

- *Limits on international recruitment in the name of development*. These take information about job opportunities freely available to professionals in migrant destination countries and make it more difficult for professionals in other countries to access. This is inherently coercive to developing-country professionals and it does not constitute "ethical conduct", as Alinsao et al. (2008) and others assert. An example of this policy is the British National Health Service's "code of practice" for international recruitment.

- *Destination country 'self-sufficiency' in professional fields*. This too does nothing but block the international movement of skilled workers, by ensuring that jobs available to them overseas are filled by natives of those countries instead. 'Self-sufficiency' in any professional field is logically equivalent to zero immigration by professionals in that field. Zero immigration is not the proper goal of any country seeking to foster development. Proposals of this sort include that of the World Medical Association (2003).

- *Punitive and extractive measures against emigrants*. Also coercive are policies whose goal is to punish migrants or confiscate their resources. These include the emigration tax advanced by Bhagwati and Dellalfar (1973), South Africa's policy restricting the domestic licensing of nurses who work abroad, exorbitant administrative fees such as high passport costs (McKenzie 2007), and outright limits on "exit visas" by Cuba (Wilkinson and Manuel 2005), China, and several other countries.

Best practice should rather seek to address the underlying causes of emigration, expanding skilled workers' choices in ways that preserve or expand their substantive freedoms while at the same time encouraging desirable development outcomes. Rather than simply consider skilled workers in difficult environments as 'surplus' human capital, policy should seek ways to maximize the development effects of human capital, wherever it is located, and without coercion. Below we discuss several such measures.

Best practice 1: Improve incentives for quality service to those in need

Much can be done to increase the positive externalities of existing human resources in developing countries. Unannounced visits to many developing country health facilities, for example, find that large fractions of the personnel being paid to be there are simply absent (Banerjee and Duflo 2006). Many countries lack effective rural service incentives and skilled professionals remain tightly concentrated in urban settings. When domestic professionals are deployed more effectively, professionals have fewer reasons to move internationally and those movements matter less to overall service provision.

Chomitz et al. (1998) review data on the relationship between Indonesian doctors' choice of location for a required three-year public service following graduation and the incentives they face, both in hypothetical questionnaires and by revealed preference following an incentive policy reform. They show that doctors from Java require a wage increment of US$400 per month to choose service on outer islands, but 1) this falls to only about US$130 for doctors who are originally from outer islands, and 2) roughly the same effect arises from offering doctors from Java a 50% chance of a civil service appointment following three years of public service on outer islands. In South Africa, too, medical students from rural areas are far more likely to end up working there (Kumar 2007). This suggests that weighting medical school admissions more heavily towards outer islanders, weighting civil service appointments more heavily towards those willing to complete public service on outer islands, and modest cash incentives are effective ways to deploy existing human resources for health more effectively to underserved populations.

Much can also be done in even more resource-constrained settings to improve the public impact of existing professionals. McEwan (1999) reviews in-kind incentives for rural services that have been effectively used around the world, including accelerated promotion opportunities, special training, housing allowances and credit, and early retirement. Serneels et al. (2007) survey first-year nursing and medical students in Ethiopia and find that the wage increment required to induce the entire cohort to choose a rural posting after graduation amounts to less than 1% of the Health Ministry's budget. The results also suggest that the financial incentives required by doctors could be even smaller if doctors posted in rural areas were given preferential access to

in-service training. Lindelöw and Serneels (2006) provide evidence from focus groups of patients and providers on several limits to the public impact of Ethiopian health professionals, including shirking, absenteeism, drug pilfering, illicit charging, and corruption. They suggest that many of these can be reduced by improving regulation of combining public and private sector work, reducing cronyism in the allocation of urban public postings, and decentralized mechanisms for patients to report abuses by local providers.

Similar lessons extend to many other countries. Leonard, Masatu, and Vialou (2007) show that the quality of care delivered by Tanzanian health professionals, as measured by adherence to standard primary care protocols, is less related to level of training than to the type of organization within which the provider works. Specifically, those working in facilities with decentralized decision-making authority provide higher-quality care at lower levels of training and at lower cost than in centralized public facilities. Lindelöw et al. (2004) show that in Mozambique, improvements in pharmaceutical distribution systems, harmonization of rules governing user payments, and improved record-keeping would go far to help Mozambique's existing human resources for health translate into improved health for the population. Eichler and Levine (2009) review successful experiences in improving health systems by innovations in performance incentives in Kenya, Uganda, Rwanda, Brazil, and elsewhere.

Best practice 2: Innovate in education finance

Systems of education finance that unconditionally guarantee free higher education are built for an immobile world that is gone forever. While African and Caribbean countries are concerned that migration itself causes domestic shortages of nursing and a drain of public schooling subsidies, in the Philippines the massive emigration of nurses has created more nurses than it has taken away, and it has done so largely without adverse fiscal effects. The reason for this is that an enormous system of private nursing education has arisen in the Philippines, encouraged by the government. The large majority of emigrant Filipino nurses pay for their educations, either up front or ex post via credit markets or via their employers by accepting lower salaries abroad.

The enormous wage gains to international migration would likely make large numbers of skilled workers from developing countries willing and able to finance the cost of their training with those gains, as they have in the Philippines, if institutions existed for this purpose. There are multiple ways to shift the financial burden of training onto skilled workers and destination countries without coercing or taxing migrants.

First, policy can encourage or at least not discourage the formation of credit markets for this purpose. Students with aspirations abroad should be able to finance their own education even if they do not come from a wealthy background, by taking loans. But these markets are often simply nonexistent. No public or private institutions of higher education in Mozambique, for example, currently offer loans to students to finance any type of university studies (Fernandes and Mattoo 2009). This ensures that all tertiary graduates who migrate must take embodied investment with them when they leave, and allows no mechanism for those graduates to pay for it even if they wished to. Many countries do things very differently: Kenya has had a means-tested Higher Education Loan Scheme since 1995 (Oketch 2003, Johnstone 2005). Makerere University in Uganda broke its complete dependence on state funds in the mid-1990s, so that today the large majority of its students pay fees (Court 1999), but has yet to follow Kenya's lead on encouraging student loans (Kwesiga and Ahikire 2006). Though Ghana has had mixed results with a scheme of loans for higher education that has teetered toward bankruptcy, many of its problems relate to the inability of unemployed graduates to pay—difficulties that would be far less pronounced for skilled emigrants (Atuahene 2006).

Second, policy can make provisions for publicly-trained graduates who wish to work abroad to financially compensate the state for their education ex post, without shame and reprobation. This would simply require a decision on the part of the government. Many developing countries already allow their citizens to financially compensate the state in return for relaxing public obligations of different kinds—including those following publicly-funded training, but not limited to those. The Gambian government allows students given public scholarships for foreign study to repay a bond in the amount of their scholarship if they choose not to return home after study (Wadda 2000). The Indian government allows publicly-trained doctors to be absolved of their rural service requirement upon repayment of a bond. Russia is experimenting with the

introduction of higher education grants that become loans if the graduate does not work in occupations of critical social need. Turkey and Syria allow expatriate citizens to escape most required military service in exchange for a payment of several thousand dollars. There are many other examples. What they have in common is a vision of expanding options for international movement while creating mechanisms so that those choices need not drain public funds.

Finally, foreign institutions can establish training centers in migrant-sending countries where education is directly subsidized by migrant-receiving countries. The Australia-Pacific Technical College, founded in 2006, is a leading example of this model. It provides training subsidized by AusAID at institutions in Pacific island developing nations such as the Vanuatu Institute of Technology and the National University of Samoa. Courses are in areas like tourism/hospitality, automotive maintenance, and basic health care. A technical advisory group ensures that training is attuned to industry needs in the region, both in small island states and in Australia so that the program serves the purposes of strengthening local training institutions, expanding the regional supply of skilled labor, and expanding local and overseas job opportunities for Pacific Islanders. It plans to have roughly 3,000 graduates by the year 2011.

Best practice 3: Match subsidized skills to local needs

Where education is to be subsidized, it should be education that has the highest social return *given* that workers may move. This means subsidizing skills whose private returns are higher at home than abroad, through carefully matching scholarships, curricula, and institutional subsidies to national needs rather than broader international norms. Two key ways to accomplish this lie in shaping the curriculum by which skilled workers receive public training, and in shaping the public jobs that are created for them.

The first way is to adapt higher education curricula to local conditions. The curriculum of most medical schools in sub-Saharan Africa has an “international” focus, preparing physicians to use the latest and most advanced pharmaceuticals, equipment, and procedures. A minority of medical schools—including limited numbers in the Gambia, Cameroon, Ethiopia, Nigeria, Malawi, and

South Africa—have begun to adopt a more locally relevant curriculum. These include treatment algorithms adapted for scarcity conditions, precautions needed when patients share beds, drug usage in the absence of refrigeration, advanced diagnostic techniques utilizing basic equipment such as stethoscopes, a focus on prevention of the most deadly local diseases, and training rotations in slums and rural areas. In other words, "locally relevant medicine should be seen as a medical specialty", and training subsidies should be shifted towards that specialty (Eyal and Hurst 2008). There is ample room to adjust curricula to local conditions in other disciplines as well. Engineering curricula in Mozambique, for example, should be shifted towards training in road maintenance, and law curricula should be shifted towards tax law to meet the needs of foreign investors (Fernandes and Mattoo 2009).

The second way is to create a diverse range of subsidized public sector employment attuned to the needs of the least served populations. Many countries, for example, have made better use of existing human resources for education by expanding the use of "community teachers" and "para-teachers". These programs focus training on people from underserved communities, provide lower levels of training and more limited compensation, but create paraprofessionals who work in underserved communities at much higher rates than full professionals. A leader in this area was Senegal, which succeeded in reopening hundreds of closed schools at a fraction of the cost of deploying more traditional civil-servant teachers. Other countries that have expanded access to basic education in rural areas by shifting resources towards community teachers include Niger, Guinea, Togo, Burkina Faso, Cameroon, India, Bangladesh, China, Peru, Chile, and Nicaragua (Fyfe 2007). An analogous shift has taken place in the health systems of many developing countries, known as "task shifting". This puts greater emphasis on public paraprofessional jobs in the health sector such as Malawi's "medical officers", Mozambique's "técnicos de medicina", community health workers in Uganda and Ethiopia, and the historically important "barefoot doctors" of China and "medical assistants" of Ghana (McPake and Mensah 2008, Eyal and Hurst 2008).

In short, subsidizing skills apt for the international market is an important underlying cause of professional emigration, and therefore of migration's proximate impacts. Subsidizing skills for local needs is a preferable alternative to the more traditional method of "train and trap". A

common objection to proposals of this type is that people in poor countries deserve "the best" health professionals and teachers, and task shifting robs them of these. But surely "the best" service providers are those who are present and whose skills are best adapted to the pressing needs of the worst served populations. A better perspective is that people in developing countries deserve health and education, and subsidies should be directed in ways that achieve those ends—which could include a greater emphasis on paraprofessionals.

Best practice 4: Disassemble domestic barriers to service provision

Many countries simultaneously have shortages of professionals while large numbers of professionals in the same sector are unemployed. In spite of profound skill shortages the unemployment rate of skilled workers is very high in many developing countries. Unemployment has at times been even higher among university graduates than among primary school graduates in Nigeria (Dabalen et al. 2000), and in Morocco, Jordan, and Egypt (Said 2001). One way that this paradoxical situation can arise is through regulatory barriers that complicate the hiring of skilled workers into public service, such as legal requirements that all providers of a certain service be full civil servants with de-facto lifetime employment (and other regulations reviewed by Djankov and Ramalho 2009).

Another way is regulatory barriers to the emergence of private employment in crucial sectors. Kenya, for example, in 2006 had roughly 6,000 trained and licensed but unemployed Registered Nurses in the country, and their services were greatly needed by the population. But because Kenyan law forbid even a highly-trained Registered Nurse without ten years of work experience from opening a private clinic without physician supervision, regulation ensured that the employment of unemployed nurses was tightly constrained by budgets to train and employ costly physicians. This blanket regulation persisted in the absence of clear evidence that patient outcomes for the majority of basic-needs cases suffered to any degree under nurses rather than physicians. Overregulation of this kind tends to block access to basic health care in the least-served areas, as well as to increase pressure for unemployed nurses to emigrate.

It does not have to be this way. In Zambia until very recently, private clinics without a physician could not be licensed at all, blocking all nurses from legally and independently providing even the most basic private care. In 2008 the health professions licensing law was redrafted and is now under consideration by parliament. The new law, if passed, will recognize the right of a nurse or midwife to run a private practice within the scope of his or her skills. Analogously, until 2005 the government of Ethiopia barred the distribution of subsidized antiretroviral therapy for HIV/AIDS through private clinics, even though many people's primary access to quality modern health care comes through employer-run clinics. Repeal of these restrictions in the last few years has greatly expanded access to this therapy without requiring an expansion in human resource stocks per se. Similar deregulation has been pursued in Ghana, Kenya, Uganda, Namibia, and South Africa (Feely and O'Hanlon 2007).

Other barriers to professional employment extend beyond the legal realm. Docquier et al. (2007) have revealed that skilled-worker emigration rates are substantially higher among skilled women than skilled men in most developing countries. Women with tertiary education are more than 40% more likely to emigrate to OECD countries than men with tertiary degrees in Guatemala, Zambia, Malawi, Togo, Afghanistan, Ghana, Croatia, Uganda, and Papua New Guinea, among other countries. While this could be the product of many forces, such as the types of occupations via which skilled workers emigrate from each country, a plausibly large contributor to this pattern is structural barriers to professional achievement by skilled women in their countries of origin. This underlying force blunts the effective deployment of skilled women's talents and contributes to the emigration choice. Reducing barriers of this kind is a proper target for policy. In the absence of improvements to career prospects for Afghan women, for example, the departure of skilled Afghan women should be hailed as their ticket to opportunity rather than lamented as a "drain".

Best practice 5: Support regional centers of excellence

An important special case of skill flow and fiscal policy is that of smaller countries with incomplete or absent institutions of higher education, so that tertiary graduates in many or even

most disciplines are necessarily trained abroad. Small countries that subsidize higher education abroad can face a tradeoff: On one hand, it is difficult to finance overseas training for migrants who do not return. On the other hand, economies of scale in higher education mean that it is also difficult to establish high-quality training centers everywhere.

Certainly, skilled workers are more likely to live and work in a place when they receive their tertiary training in that place (e.g. Chomitz et al. 1998). Nevertheless, large fractions of skilled workers from small states who acquire higher education abroad do return to live and work in their countries of birth. Gibson and McKenzie (2009) carefully track down and survey top secondary school graduates from Tonga and Papua New Guinea (PNG) from most years since 1976. Of Tongans, 87% had ever lived outside Tonga (almost all of whom had acquired higher education overseas), but 53% were living in Tonga in 2007-8. Of Papua New Guineans, 42% had ever lived outside PNG (87% of whom acquired higher education abroad), but 89% of them still lived in PNG in 2007-8. Very large fractions of skilled workers from small states who are trained abroad do end up returning home.

All of this suggests that higher education subsidies by small states can be effective in building human capital stocks at home when they are properly directed. A good compromise is for small countries to support regional centers of excellence in training. Twelve small states of the Pacific region have created the University of the South Pacific, whose flagship campus (among 15 campuses) is in Fiji. This arrangement allows Tokelau, population 1,600, to benefit from pooled training resources covering 1.3 million people. Member country governments sponsor their own citizens' study, but privately-funded study and international-donor scholarships are also available. Likewise, 16 small states and territories in the Caribbean have formed the University of the West Indies. Many of its graduates remain in the region, including eight current and former prime ministers of Caribbean states, while other graduates spend much of their lives outside the region, including Nobel laureates Arthur Lewis and Derek Walcott.

Best practice 6: Support temporary return by skilled emigrants

Incentives for the permanent return of skilled emigrants are shaped by forces much larger than policy. While many governments such as Taiwan's have actively offered return incentives to skilled workers abroad, such as the creation of the Hinschu Science-based Industrial Park, ultimately the rising return migration of skilled Taiwanese workers in the 1980s and 1990s was likely determined by attractive job opportunities and political freedoms at home (O'Neil 2003). Over 2,000 Mexicans abroad with doctorates who agreed to return to Mexico received one year of salary support from Mexico's Presidential Fund for Retention between 1991 and 2000, at a total cost of US$56 million, but it is unclear how many of those people would have returned in the absence of the program (Thorn and Holm-Nielsen 2008). Survey evidence suggests that recent rises in return migration by Indian physicians are attributable to the rise of the corporate health care industry in that country rather than to any particular policy initiative (Haour-Knipe and Davies 2008).

There may be a greater opportunity for policy to influence temporary returns in more difficult origin-country settings, but little clear evidence exists on the effectiveness of temporary return incentives. The IOM's "Temporary Return of Qualified Nationals" program and "Migration for Development in Africa" program help link interested skilled workers abroad with short-term positions in key ministries and other organizations at home. The UN's "Transfer of Knowledge Through Expatriate Nationals" program has for many years played a similar role (Newland et al. 2008). The development impacts of these programs are difficult to assess and have not been systematically evaluated.

At the very least, destination countries of skilled-worker movement should eliminate needless barriers to temporary return. Skilled workers pursuing naturalization in the United States, for example, are required to remain continuously present in the US for years while their case is considered. The "Return of Talent Act", introduced in the US Senate in 2007, would have created exceptions to that restriction for skilled workers wishing to assist in reconstruction following conflict or natural disasters in their home countries. But the bill never made it to a full vote of the US Congress and did not become law.

Conclusion

All of these "best practice" policy levers have two things in common: First, they expand the choices available to skilled workers. For example, rural service incentives reduce the tradeoff between serving underserved populations and personal hardship. Second, they are more effective than shaping professionals' migration choices *per se* because they address the underlying causes of those choices. For example, removing barriers to professional employment at home can change decisions freely made by potential emigrants. The common trait of "worst practice" policies is that they seek to limit skill flow itself, which is to say, to limit choices by skilled workers.

It is time to bury the unpleasant and judgmental term "brain drain". It was adequate for the inflammatory needs of the nationalistic British journalists who coined the term four decades ago, but it is inadequate to today's level-headed discussion of policies that shape skilled workers' lives. Calling the rate of skilled worker movement the "brain drain rate" is just as ludicrously value-laden as measuring the rate at which women traded the kitchen for the workplace in the 1950s and labeling it the "rate of family abandonment". It is likewise analogous to observing British workers switch from low-income farm employment to high-income factory work around 1800 and labeling this the "Great Farm Drain" rather than the "Industrial Revolution". It is furthermore much like creating a new database of tariff rates and calling its numbers the "patriotic commerce rate".

Sententious terms like these would be laughed out of serious policy discussion, but somehow even careful and nuanced thinkers continue to speak of "brain drain", a locution whose only virtue is its rhyme. If you need a two-syllable way to speak of international migration choices made by highly skilled workers, I suggest "skill flow". It is brief, accurate, and neutral. Greater use of such language might help open the door to policies that help deploy skills for development without coercion, policies that take skilled workers' human capabilities seriously rather than thinking of those workers primarily as human resources. Policies of this kind are our first arms in the fight for development, not the last, if Sen (1999: 298) was right to call development "a momentous engagement with freedom's possibilities."

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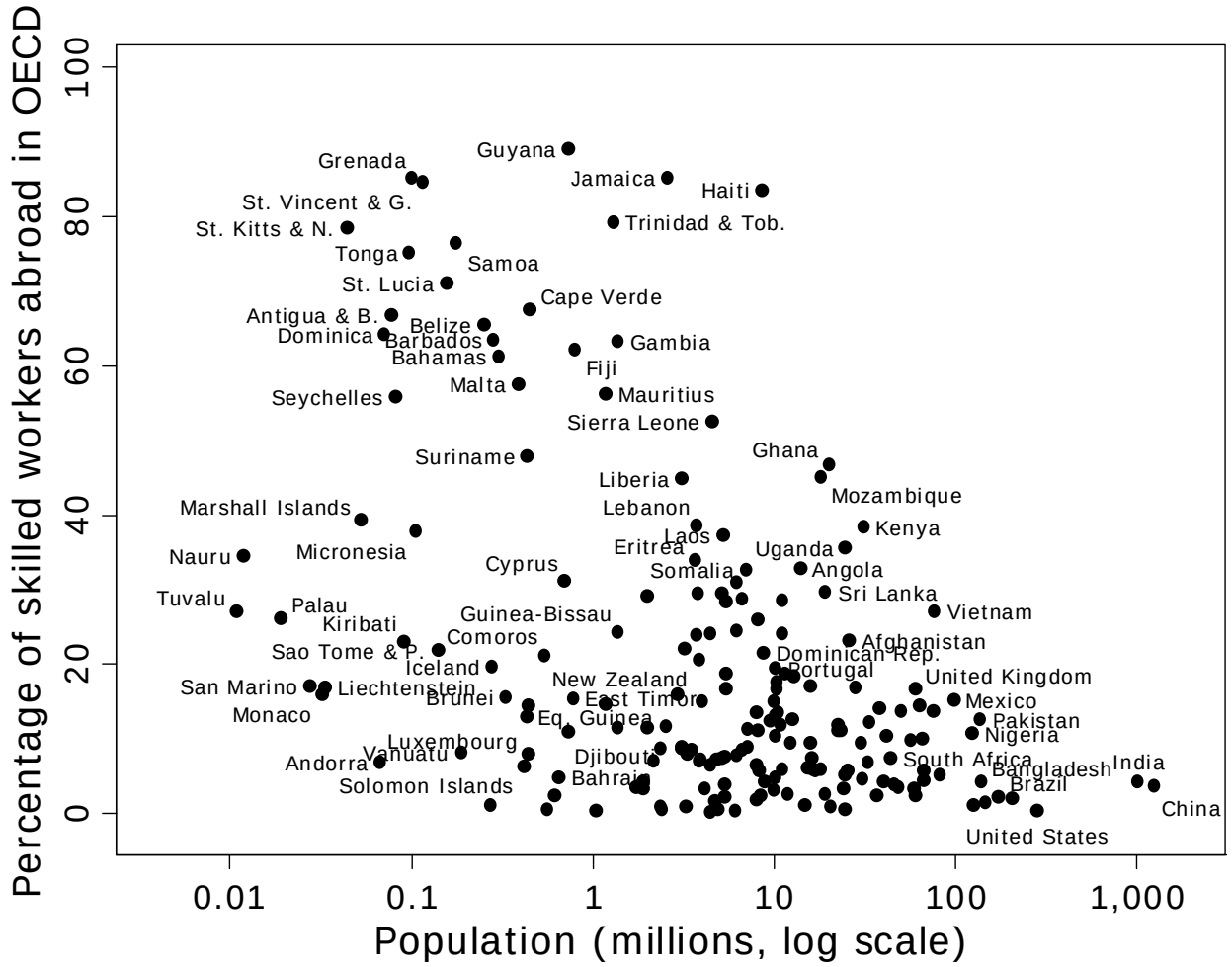
Figure 1: The percentage of skilled workers born in each country who live in the OECD



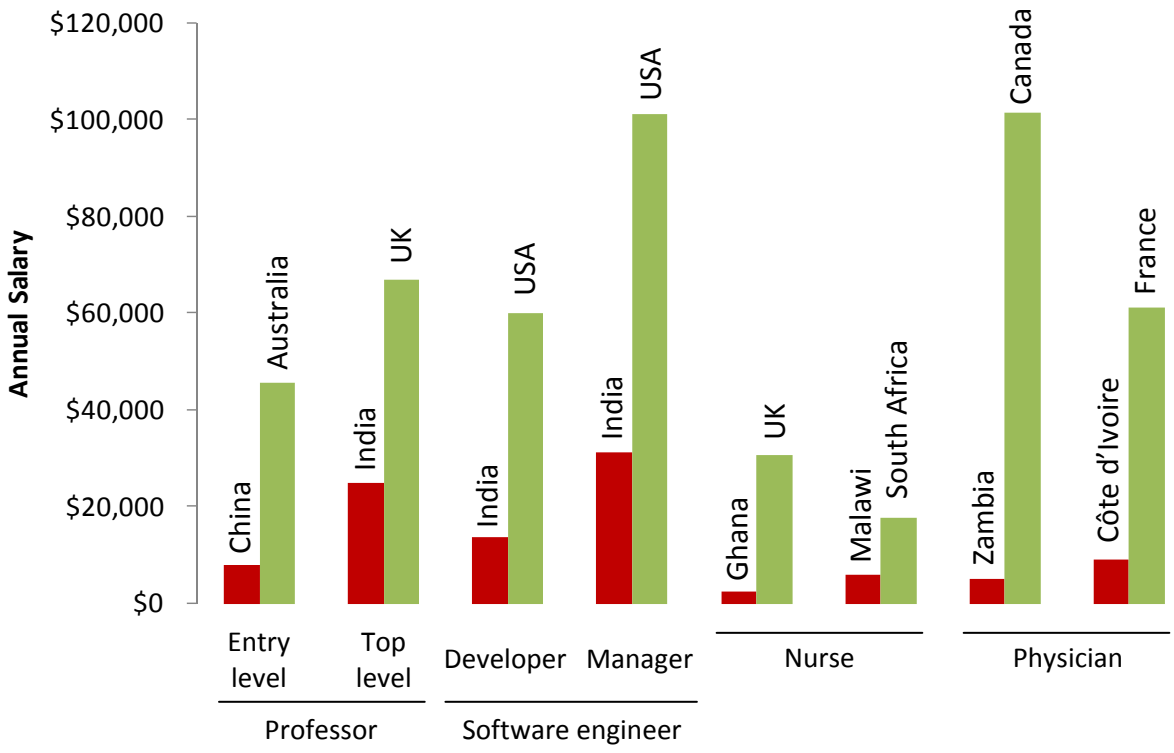
The vertical axis shows the number of people born in each country age 25 or over who have attained tertiary education (completed 13 or more years of schooling) and resided in an OECD country in the year 2000, as a percentage of the number who resided either in their countries of birth or in the OECD. The horizontal axis shows total population of each country. Source: Docquier and Marfouk (2006).

Table 1: The numbers of skilled workers from developing countries living abroad is high and increasing.

Fraction of tertiary-educated naturals living abroad in OECD, Top 20 countries in 1990		Fraction of tertiary-educated naturals living abroad in OECD, Top 20 countries in 2000		Top 20 countries by proportional increase in fraction of tertiary educated naturals living abroad in OECD, 1990-2000			
					1990	2000	Change (multiple)
Samoa	96.7%	Guyana	89.0%	Equatorial Guinea	1.1%	13.0%	11.8
Tonga	96.2%	Grenada	85.1%	Angola	4.6%	33.0%	7.2
Guyana	91.1%	Jamaica	85.1%	São Tome & Príncipe	3.6%	22.0%	6.1
Palau	88.9%	St. Vincent & Gren.	84.5%	Mongolia	0.2%	1.1%	4.7
Jamaica	85.1%	Haiti	83.6%	Mauritania	2.8%	11.8%	4.2
Nauru	82.5%	Trinidad & Tobago	79.3%	Albania	2.4%	9.0%	3.8
St. Vincent & Gren.	80.7%	St. Kitts and Nevis	78.5%	Andorra	2.3%	6.9%	3.0
Gambia, The	80.4%	Samoa	76.4%	Comoros	7.0%	21.2%	3.0
Haiti	78.6%	Tonga	75.2%	Nepal	1.8%	5.3%	3.0
Saint Kitts and Nevis	77.8%	Saint Lucia	71.1%	Swaziland	0.2%	0.5%	2.8
Trinidad and Tobago	77.8%	Cape Verde	67.5%	Gabon	5.4%	14.6%	2.7
Grenada	77.7%	Antigua and Barbuda	66.8%	Guinea-Bissau	9.3%	24.4%	2.6
Tuvalu	74.6%	Belize	65.5%	United Arab Emirates	0.4%	1.0%	2.6
Marshall Islands	70.9%	Dominica	64.2%	Kuwait	2.8%	7.1%	2.5
Malta	68.8%	Barbados	63.5%	Congo, Rep.	9.4%	22.2%	2.4
Dominica	68.6%	Gambia, The	63.3%	Bangladesh	2.1%	4.3%	2.1
Kiribati	68.5%	Fiji	62.2%	Côte d'Ivoire	2.9%	5.7%	2.0
Saint Lucia	67.7%	Bahamas, The	61.3%	Somalia	17.4%	32.7%	1.9
Belize	67.3%	Malta	57.6%	Pakistan	6.9%	12.6%	1.8
Barbados	67.3%	Mauritius	56.2%	Mali	8.2%	15.0%	1.8

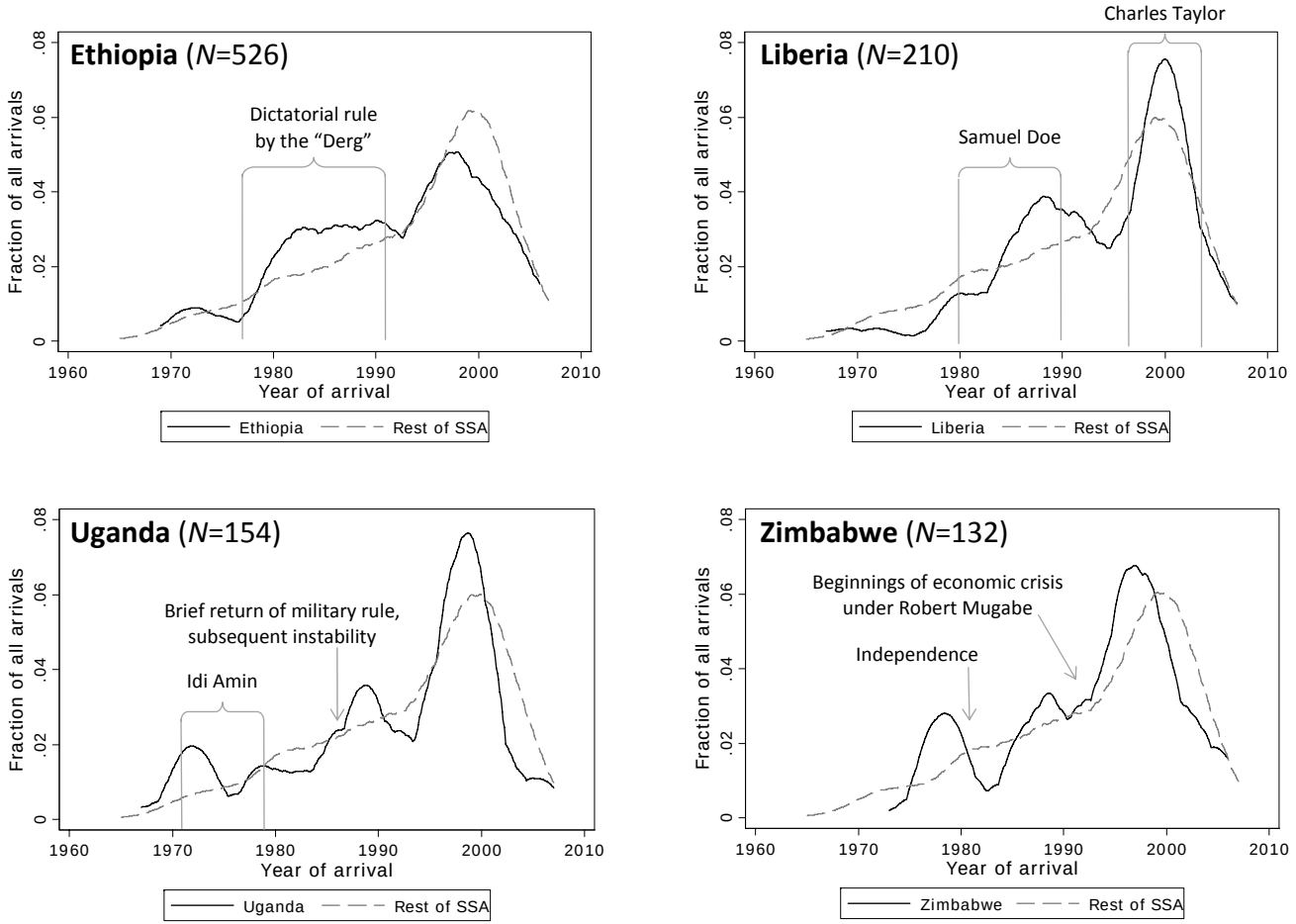
Source: Docquier and Marfouk (2006).

Figure 2: Gaps in average professional salaries, selected country pairs



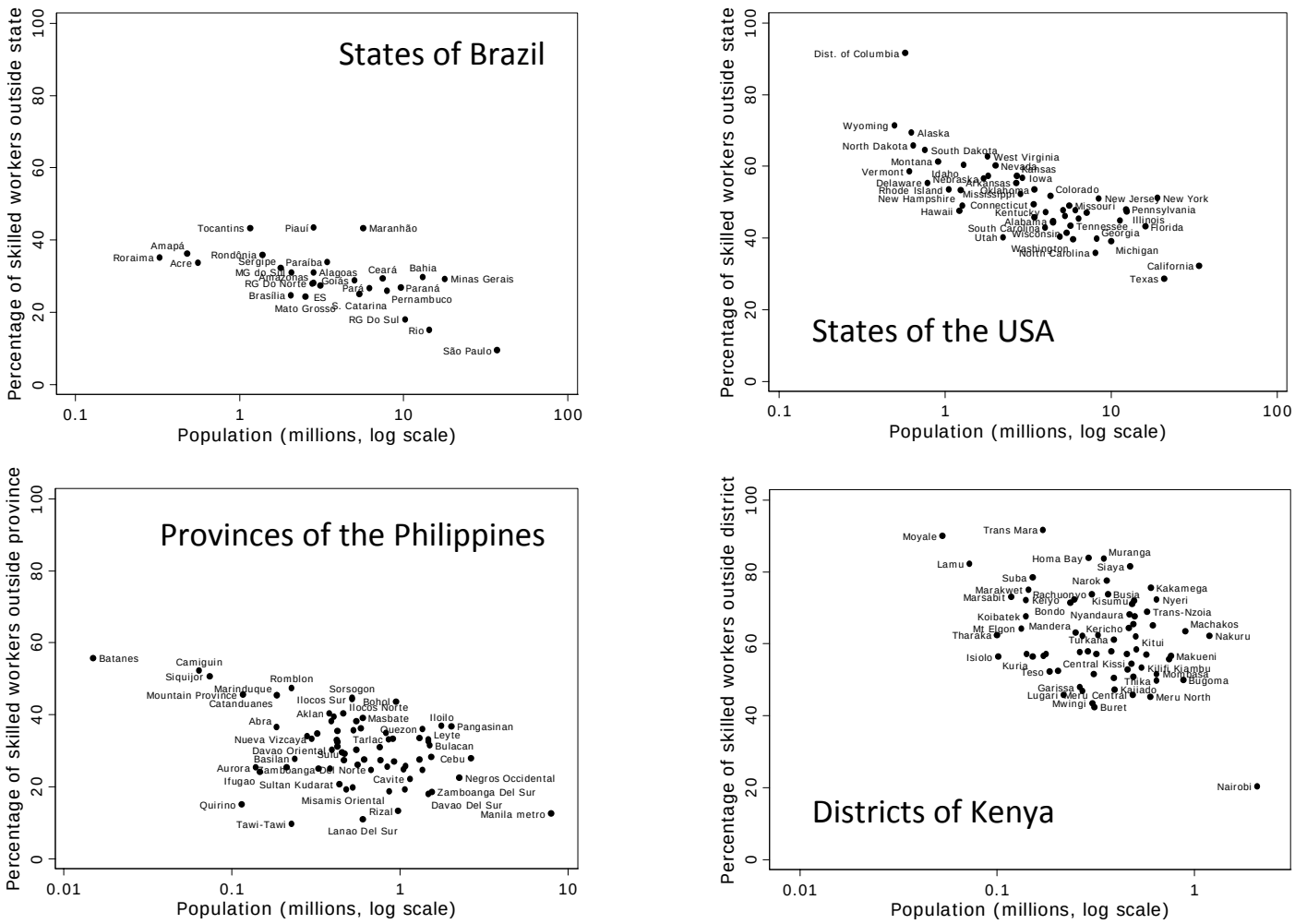
Salaries are converted to annual US dollars and adjusted (by the original sources) for differences in purchasing power across countries. Professor salaries from Rumbley et al. (2008: 22), software engineer salaries from Commander et al. (2004: 26), and nurse and physician salaries from Vujicic et al. (2004: Table 2).

Figure 3: Year of arrival for skilled African workers with higher education who arrived in the United States as adults (age 25+) and resided in the US during 2005-2007: Selected countries compared to rest of sub-Saharan Africa (SSA)



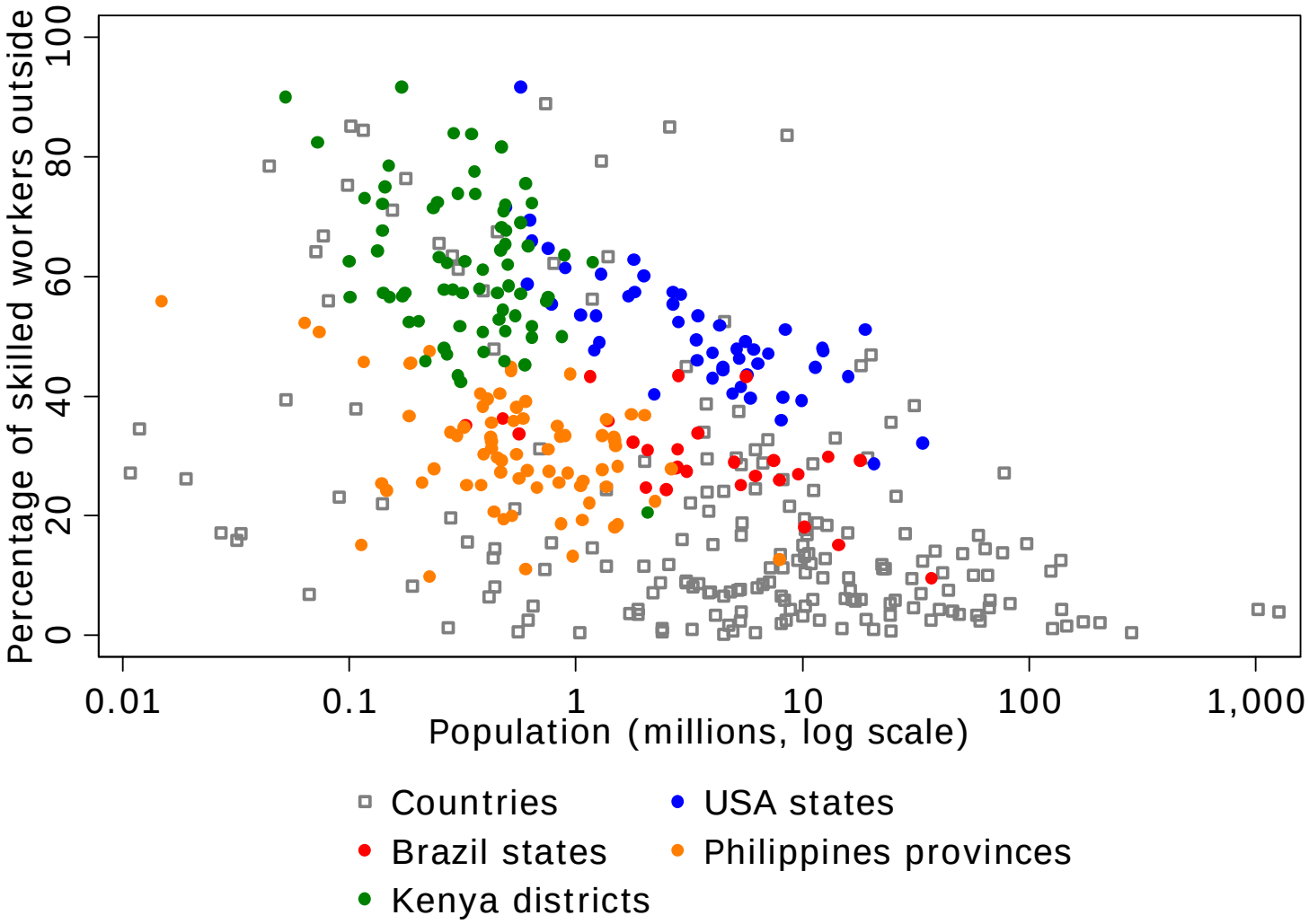
Source: United States American Community Survey pooled 2005-2007 Public Use Microdata Series. Plots show people by sub-Saharan African country of birth, with tertiary education ("some college" or greater) and working in a skilled job in the United States (occupation codes 0010 to 3650) whose year of arrival is at least 25 years after their year of birth. Kernel density plots shown (bandwidth 1.5, Epanechnikov kernel, weighted by sampling weight).

Figure 4: Patterns of skilled worker movement at the national level in four countries



Minnesota Population Center (2008). Data for the USA, Brazil, and Kenya are for the year 2000, the Philippines for 1990. Areas are only labeled where labels can be legible. US state populations from http://www.census.gov/population/projections/SummaryTabA1.pdf, Brazil state populations from http://www.ibge.gov.br/home/estatistica/economia/contasregionais/tabela04.pdf, others calculated from raw microdata.

Figure 5: Skilled workers' tendency to move internationally is broadly similar their tendency to move domestically



Source: Docquier and Marfouk (2006) and Minnesota Population Center (2008)